SWAMP

Sammamish/Washington Analysis and Modeling Program

LAKE WASHINGTON EXISTING CONDITIONS REPORT

September 2003

King County

Department of Natural Resources and Parks
Water and Land Resources Division

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KING COUNTY

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ABBREVIATIONS

μg	micrograms
μmhos/cm	micromhos per centimeter (equivalent to microSiemens per centimeter)
AHOD	areal hypolimnetic oxygen deficit rate
ANOVA	Analysis of Variance
chl *a*	chlorophyll *a*
CSO	combined sewer overflow
DNRP	Department of Natural Resources and Parks
DO	dissolved oxygen
ESA	Endangered Species Act
ft	feet
ICP-MS	inductively coupled plasma mass spectrometry
km	kilometers
KCEL	King County Environmental Laboratory
L	liters
LIMS	Laboratory Information Management System
m	meters
MDL	method detection limit
meq/L	milliequivalents per liter
mg	milligrams
N	nitrogen
NOAA	National Oceanic Atmospheric Administration
P	phosphorus
PAH	polycyclic aromatic hydrocarbon
RDL	reporting detection limit
SD	standard deviation
SRP	soluble reactive phosphorus
SWAMP	Sammamish-Washington Analysis and Modeling Program
TN	total nitrogen
TP	total phosphorus

TSIs	trophic state indices
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UW	University of Washington
WAC	Washington Administrative Code
WRIA 8	Water Resource Inventory Area 8

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Executive Summary

The King County Department of Natural Resources and Parks, Water and Land Resources Division has developed the Sammamish-Washington Analysis and Modeling Program (SWAMP). The purpose of SWAMP is to assist wastewater capital planning, habitat conservation, salmon recovery, and watershed planning efforts by collecting information and by developing and using a set of scientific tools to better understand the Sammamish-Washington Watershed system. The *Lake Washington Existing Conditions Report* was produced under SWAMP and summarizes 12 years of water quality data collected as part of the Major Lakes Monitoring Program, another program within King County Department of Natural Resources and Parks, Water and Land Resources Division to monitor lake conditions.

The purpose of this study was to summarize water quality conditions and trends in Lake Washington from 1990 to 2001. The report describes how Lake Washington has responded over time to watershed activities, lake nutrient inputs, ecological interactions, and seasonal or year-to-year variability. Specifically, Lake Washington water quality data were analyzed to address the following objectives:

- To characterize the current status of the lake relative to standard ecological indicators, such as transparency (water clarity), dissolved oxygen (DO), total phosphorus (TP), and chlorophyll *a* (chl *a*).
- To identify current water quality differences between nearshore and deep open water (pelagic) areas of the lake.
- To identify water quality trends during the study period, with reference to historical conditions where applicable.
- To provide information for use in making future environmental management decisions that may impact the lake.

Data collected from 1990 through 2001 indicate that the quality of Lake Washington's water supports and is consistent with the lake's beneficial uses. Some of the major findings are as follows:

- Annual whole-lake volume-weighted mean TP concentrations ranged from 10 to 18 µg/L and were lower in the last 4 years of the study period. Trend analysis showed that there is a significant trend towards decreasing whole-lake TP concentrations from 1993 to 2001. Total phosphorus concentrations in the lake are indicative of mesotrophic conditions. The 10-year overall mean of the annual volume-weighted means was 14 µg/L. External loading of TP controls TP concentrations in the lake. Internal loading of phosphorus is not a significant part of the phosphorus (P) cycle in the lake.
- Dissolved oxygen concentrations and deficit rates indicate that Lake Washington is mesotrophic, which is an improvement from the 1950s and 1960s, when it was eutrophic.

- The annual chl *a* 12-year mean was 3.4 μg/L with a summer 12-year mean of 2.4 μg/L. These concentrations indicate that the lake is mesotrophic. Highest chl *a* concentrations occurred during spring with the usual bloom of diatoms, which were the most commonly occurring algae in Lake Washington. Spring chl *a* concentrations were significantly higher than chl *a* concentrations for other seasons.
- Whole-lake total nitrogen (TN) to TP ratios ranged from 13:1 to 30:1, indicating that P was limiting algal growth. There was a trend toward increasing TN:TP ratios in the lake from 1994 through 2001, which indicates that Lake Washington has become increasingly limited by P.
- Transparency has remained consistent from year to year, with an overall mean of 4.6 meters (m). Mean summer transparencies ranged from 3.5 to 5.6 m.
- Temperature of Lake Washington ranged from 7º to 9ºC in January, during the period of complete mixing every year. The maximum temperature in both nearshore and pelagic water was between 21.5º and 24.5ºC without an increasing trend. From 1993 to 2001 there was an increasing trend in seasonal and annual average water temperatures (epilimnetic and whole lake) that may be attributed to global climate change-related increases in air temperatures. The effect of this trend on lake biota is currently unknown.
- The annual volume-weighted whole-lake TN mean concentrations ranged between 175 and 340 μg/L. No significant trend in whole-lake annual TN was found.

Overall, Lake Washington has recovered from the eutrophic, over enriched state that existed in the 1950s to 1960s. The key to rapid recovery was the lake's depth, which contained large stores of dissolved oxygen and the reduction in P loading that occurred with sewage diversion. The lake is sensitive to P loading, and the maintenance of present-day water quality is dependent on keeping P loading at or below current levels. Minimal development of the Cedar River basin has been a key factor in recovery and maintenance of lake water quality.

1. INTRODUCTION

1.1. Overview

The King County Department of Natural Resources and Parks, Water and Land Resources Division conducts an ongoing lake monitoring program that assesses water quality in Lake Washington, Lake Sammamish, and Lake Union. The Major Lakes Monitoring Program was designed to provide data that serves as a basis to evaluate the efforts in water quality improvements and protection made by the people of King County.

This report summarizes water quality conditions and trends in Lake Washington using 10 years of water quality data collected as part of the Major Lakes Monitoring Program. Data from this period were analyzed to develop a current conditions benchmark of lake water quality. This effort to assess water quality trends in Lake Washington was conducted under the Sammamish-Washington Analysis and Modeling Program (SWAMP) within King County's Department of Natural Resources and Parks, Water and Land Resources Division. The purpose of SWAMP is to assist wastewater capital planning, habitat conservation, salmon recovery, and watershed planning efforts by collecting information and by developing and using a set of scientific tools to better understand the Sammamish-Washington Watershed system. This report is the first of three reports to evaluate each of the three major lakes in the SWAMP study area. Existing conditions reports evaluating Lakes Sammamish and Union are in preparation.

1.1.1. Study Purpose

The purpose of this study is to evaluate the water quality data collected from 1990 through 2001 to describe and document how Lake Washington has responded over time to watershed activities, nutrient inputs, ecological interactions, and seasonal or year-to-year variability. Lake responses can vary from short-term variability due to seasonal weather patterns, to long-term responses due to watershed changes. These data will also be compared to available historical data and overall trends will be discussed.

Specifically, water quality data were analyzed with the following objectives:

- To describe the current status of the lake's quality relative to ecological indicators, such as transparency (water clarity), dissolved oxygen (DO), total phosphorus (TP), and chlorophyll *a* (chl *a*).
- To describe the trends in water quality during the study period, with reference to historical conditions where applicable.
- To describe current similarities and differences in water quality between nearshore (littoral) and deep open water (pelagic) areas of the lake.
- To provide information for use in making future environmental management decisions.

1.1.2. Report Presentation

This report presents the Lake Washington monitoring data from 1990 through 2001 and provides citizens, environmental managers, and scientists with access to the data. The main body of the report is organized around building an understanding of the lake based on the parameters studied. Following the Introduction, there is a brief discussion on Historical Water Column Conditions to illustrate what the water quality of the lake was prior to implementation of environmental management strategies aimed at improving and protecting lake water quality.

The Water Column Monitoring Background section provides a brief description of each water quality parameter studied and the methods for both collection and laboratory analysis. The results of the monitoring effort for 1990 through 2001 are presented in Section 4, Summary of 1990 to 2001 Monitoring Data. This section first presents a brief overview of the data results, followed by a more detailed discussion of each parameter and what can be learned about the lake status from these data. A Glossary of Terms and References precede the Appendices.

1.2. Lake Washington Characteristics

Lake Washington is the largest of the three major lakes in King County, and the second largest natural lake in the State of Washington (Figure 1). The lake is located within the watersheds drained by Issaquah Creek, the Sammamish River, and the Cedar River, referred to as the Cedar-Sammamish Watershed Basin, or Water Resource Inventory Area (WRIA) 8. Lake Washington's two major influent rivers are the Cedar and Sammamish Rivers. The Cedar River, which enters at the southern end, contributes about 57% (611 million cubic meters [m^3] per year) of the annual hydraulic load (water inflow per year) and 25% (10,100 kilograms [kg] per year) of the phosphorus (P) load (amount of the nutrient phosphorus that is delivered to the lake per year). Water from Lake Sammamish via the Sammamish River, which enters the lake from the north, contributes 27% (287 million m^3 per year) of the hydraulic load and 41% (16,400 kg per year) of the P load. The majority of the immediate watershed is highly developed, with 63% of the watershed fully developed (King County Lakes Monitoring Program, 2002). The headwaters of the Cedar River are in a protected watershed owned by the Seattle Water Department.

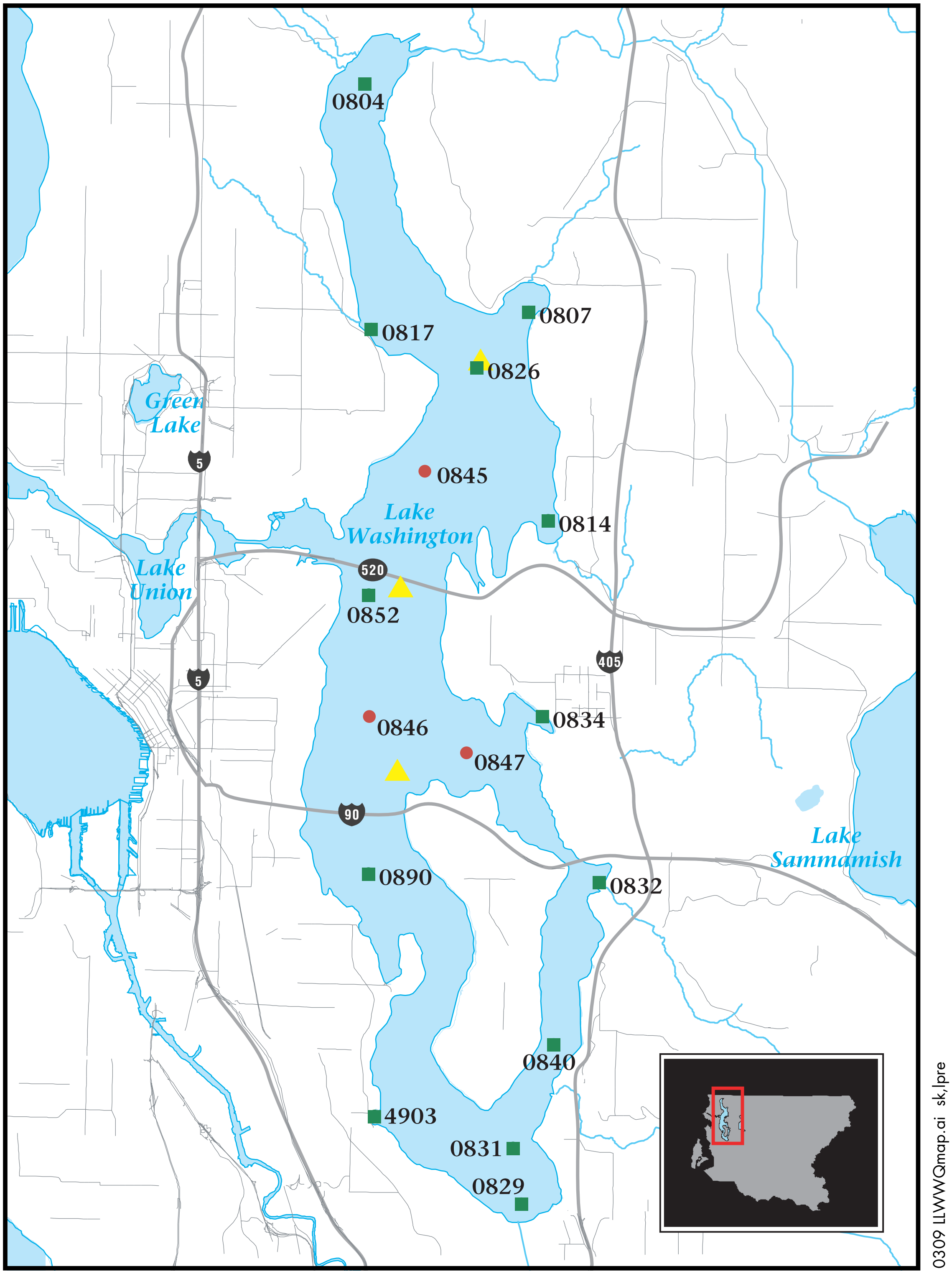

Figure 1

Location of Lake Washington Water Sample Stations

The basin of Lake Washington is a deep, narrow, glacial trough with steeply sloping sides, sculpted by the Vashon ice sheet, the last continental glacier to move through the Seattle area. The lake drains to Puget Sound and lies 6.3 m above sea level at mean lower low tide. The water passes through Lake Union and the Lake Washington Ship Canal, which was constructed in 1916 and is the only outlet from Lakes Sammamish and Washington. Prior to construction of the canal, the principal inflow was from the Sammamish River at the north end of Lake Washington, and the outflow was through the Black River at the south end of the lake (Chrzastowski, 1983). Construction of the canal resulted in the lowering of the lake 3 m to its present level, blocking off the Black River by diverting the Cedar River into Lake Washington. Mercer Island lies in the southern half of the lake, and is separated from the east shore by a relatively shallow and narrow channel, and from the west shore by a much wider and deeper channel (Chrzastowski, 1983; King County Lakes Monitoring Program, 2002). The physical characteristics of Lake Washington and its drainage basin are summarized in Table 1.

Table 1.
Physical Characteristics of Lake Washington[a]

Characteristic	English Units	Metric Units
Drainage Area	300,000 acres	1,274 km^2
Lake Area	21,500 acres	87.6 km^2
Lake Volume	2,350,000 acre-ft	2.9×10^9 m^3
Mean Depth	108 ft	32.9 m
Maximum Depth	214 ft	65.2 m
Flushing Rate	0.43 per year[b]	
Depth of the Epilimnion	33 ft	12 m
Epilimnion:Hypolimnion Ratio	0.387	
Length	13 miles	21 km
Main Inflows	Cedar River (57% of total volume) Sammamish River (27% of total volume)	
Main Outlet	Ship Canal to Puget Sound	
Typical Period of Stratification	Late March to Early December	
Trophic State	Mesotrophic	

[a] King County Lakes Monitoring Program, 2002

[b] Water renewal rate, or flushing rate, is the fraction of the lake's volume replaced per year.

Lake Washington is a monomictic (having one mixing and one stratification event per year), isothermal lake that undergoes complete mixing from the surface to bottom during December through March. In April, the lake begins to stratify, and by June the lake is strongly stratified and remains so until October. At this time the surface water cools and stratification of the lake starts to weaken until the thermal stratification that physically separates the surface waters (epilimnion) from the deeper waters (hypolimnion) breaks down, allowing the entire water column to mix.

The lake received increasing amounts of secondary treated sewage between 1941 and 1963, which resulted in increased nutrient enrichment (eutrophication) and declining water quality. From 1955 to 1973, the lake's algae were dominated by cyanobacteria, which can be severe bloom-forming nuisances. Cyanobacteria (formerly known as blue-green algae) are bacteria, not true algae, but they can photosynthesize and ecologically function similar to algae. Sewage effluent was completely diverted from the lake during 1963 and 1967, except for infrequent untreated combined sewer overflows (CSOs) (King County Wastewater Treatment Division, 2001). Rapid and predicted water quality improvements followed diversion with dramatically decreased algae abundance, especially the cyanobacteria, and associated increased transparency. The lake's eutrophication was thoroughly documented by W.T. Edmondson and associates at the University of Washington (Edmondson et al., 1956; Edmondson and Lehman, 1981; Edmondson, 1994).

1.3. Sampling Stations

Sixteen water quality sampling stations are monitored in Lake Washington (Figure 2). Five routine water quality sampling stations and three additional stations for monitoring metals are located in the deep, open waters of the lake. These deep stations are referred to as pelagic stations and have maximum sampling depths ranging from 25 to 60 m. Changes in water quality observed over time at these sites reflect broad, large-scale, and small-scale landscape changes in the watershed. Eight water quality sampling stations are distributed along the shoreline of the lake, primarily off the mouths of influent streams. These stations are referred to as the nearshore stations and have maximum sampling depths ranging from 1 to 9 m. Changes in water quality at the nearshore stations are more directly influenced by shoreline activities and by the quality and quantity of inflowing stream water than are the pelagic stations. Changes at nearshore sites often occur more quickly and are often greater than those observed in the middle of the lake. The locations of the sixteen stations, sample depths, and the analytes monitored at each are summarized in Table 2.

Station 4903 was established to document water quality impacts from the Henderson Street CSO to Lake Washington. The Henderson CSO is the last uncontrolled CSO in Lake Washington and is scheduled to be controlled by 2005. Annual means calculated for Station 4903 for water quality constituents were not statistically different from the other nearshore stations, and therefore are not discussed further in the text.

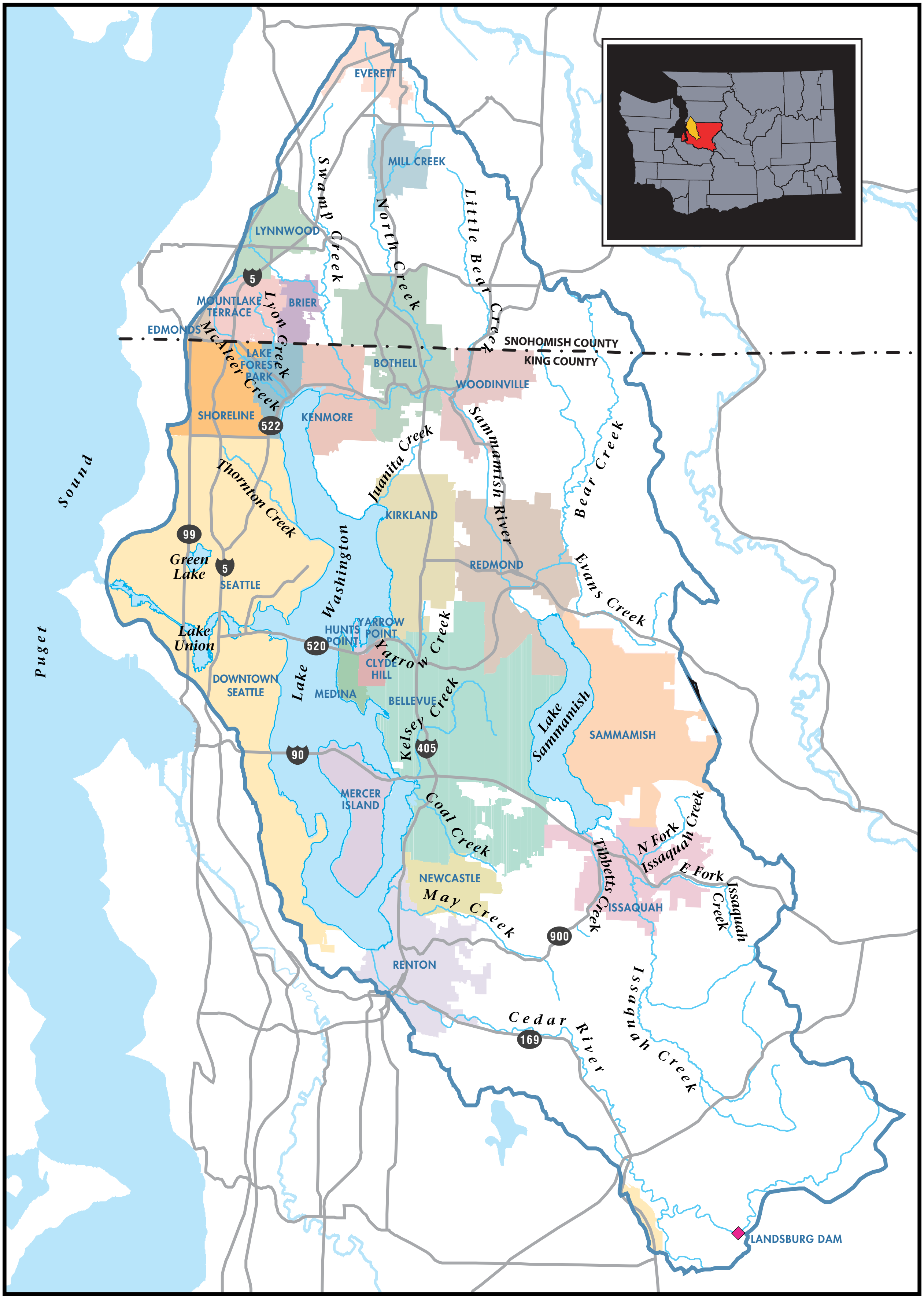

Figure 2

SWAMP Study Area

Streams
Major Roads
Study Area Boundary
Lakes

King County
Department of Natural Resources and Parks
Water and Land Resources Division

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Table 2.
Water Quality Sampling Stations in Lake Washington

Locator Number	Description of Sampling Site (Influent Stream in Parentheses for Nearshore Stations)	Type of Station	Depth (m)	Primary Sampling Depths (m)	Number of Organics Samples Collected	Number of Metals Samples Collected	Conventionals Sampled
0804	North end, mid-bay	Nearshore	8	1, 3, 8	1	19	Yes
0807	Juanita Bay, mid-bay	Nearshore	3	1, 3	16	17	Yes
0814	Yarrow Bay, south end	Nearshore	7	1, 7	1	18	Yes
0817	Matthews Beach, near Thornton Creek	Nearshore	3	1, 3	16	19	Yes
0826	Mid-lake north, off Sand Point	Pelagic	47	1, 5, 10, 15, 20, 25, 30, 40, 47	16	40	Yes
0829	South end, near Boeing ramp	Nearshore	9	1, 9	1	19	Yes
0831	Mid-lake south	Pelagic	25	1, 5, 10, 15, 20, 25	17	38	Yes
0832	Newport Yacht Basin, near Coal Creek	Nearshore	1	1	1	9	Yes
0834	Meydenbauer Bay, near Meydenbauer Park	Nearshore	7	1, 7	17	17	Yes
0840	East Mercer Island channel	Pelagic	25	1, 5, 10, 15, 20, 25	16	18	Yes
0845	Lake Washington, off Wolf Bay, in open water	Pelagic	59	1, 57, 58, 59	0	25	No
0846	Lake Washington, off Madrona Park, in open water	Pelagic	58	1, 53, 56, 57, 58, 59, 64	0	24	No

Table 2.
Water Quality Sampling Stations in Lake Washington (Continued)

Locator Number	Description of Sampling Site (Influent Stream in Parentheses for Nearshore Stations)	Type of Station	Depth (m)	Primary Sampling Depths (m)	Number of Organics Samples Collected	Number of Metals Samples Collected	Conventionals Sampled
0847	Lake Washington, off Chism Park, NE of Calkins Point (Mercer Island)	Pelagic	45	1, 42, 44, 45, 46, 47	0	22	No
0852	Madison Park	Pelagic	60	1, 5, 10, 15, 20, 25, 30, 40, 50, 55, 60	15	41	Yes
0890	South of I-90, south-central basin	Pelagic	47	1, 5, 10, 15, 20, 25, 30, 40, 45	16	40	Yes
4903	CSO - Lake Washington, combined sewer overflow at Henderson St.	Nearshore	1	1	4	11	Yes

Source: King County Lakes Monitoring Program, 2002

2. HISTORICAL WATER COLUMN CONDITIONS

2.1. Response to Wastewater Diversion

The recovery of Lake Washington following wastewater diversion is one of the most celebrated and dramatic cases in the world (Cullen and Forsberg, 1988; Edmonson, 1991; Cooke et al., 1993). These are appropriate terms to describe the lake's recovery, because at the time of the diversion (in the 1960s), there was much doubt in the scientific community whether recovery from a eutrophic state was even possible. Two principal reasons for the recovery's fame are:

1. The long-term data record, which documented the following:
   - The lake's transition to a eutrophic, over-enriched state in the early 1950s (Edmondson et al., 1956; Edmondson, 1994).
   - The lake's recovery following diversion of 88% of the phosphorus loading from 1963 to 1967 (Edmondson, 1970, 1978; Edmondson and Lehman, 1981).
2. The rapid recovery from a pre-diversion, whole-lake TP concentration of 64 µg/L, which was illustrated by the following;
   - An equilibrium level of about 20 µg/L was reached by 1970 (Figure 3); the winter mean for 1969 through 1975 was 19 µg/L.
   - The equilibrium was reached only 3 years after diversion was completed.
   - The TP concentration reached 90% of the equilibrium level in just over 2 years.

The January whole-lake TP concentration remained stable from the remainder of the 1970s, with a 4-year (1976 through 1979) mean of 17 µg/L (Figure 3). January or January-March means were used in past work on Lake Washington because the lake was well mixed and P concentrations were highest during that time of year (Edmondson, 1994). As will be discussed in Section 4.2.5.1, January volume-weighted, whole-lake TP has continued to average 15 µg/L from 1990 through 2001. That level is similar to the summer mean surface water concentration, which has averaged 16 µg/L from 1990 through 2001.

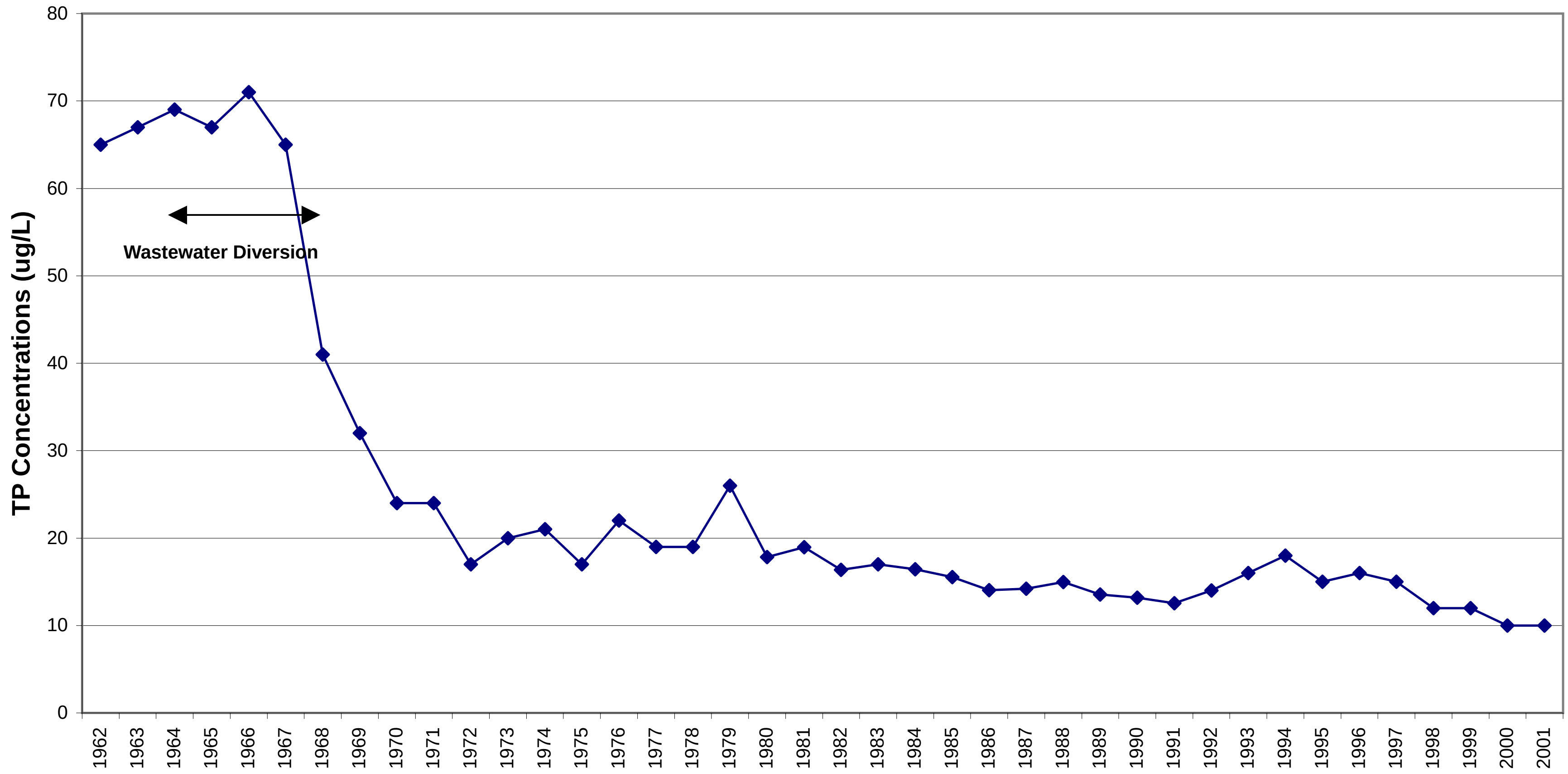

Figure 3. Changes in Whole-Lake Total Phosphorus Concentrations from January 1, 1962 to1979 in Lake Washington Before, During, and After Diversion of Secondary Treated Wastewater (modified from Edmondson and Lehman, 1981)

Several factors contributed to Lake Washington's prompt recovery to a lower equilibrium phosphorus concentration following its decreased phosphorus input. These factors include the lake's (1) relatively fast water renewal rate (~ 0.4/year); (2) depth (64 m maximum, 37 m mean); (3) aerobic hypolimnion with a relatively small epilimnion:hypolimnion ratio; and (4) relatively short period of enrichment. Water renewal rate, or flushing rate, is the fraction of the lake's volume replaced per year. In this case, a water renewal rate of 0.4 times per year means that the whole water volume of Lake Washington is theoretically replaced in 2.5 years. So, in effect, the residual, high nutrient-laden lake water was quickly diluted by, or replaced with, low nutrient inflow water supplied in large part by the Cedar River, which contains a volume-weighted inflow concentration of only 17.2 µg/L (see Section 4.5.2.1).

The relatively deep character of the lake allows strong thermal stratification, which separates the surface (epilimnion) and bottom (hypolimnion). Strong stratification reduces nutrient availability for algae in the well-lighted epilimnion; nutrients that sink from the epilimnion during summer are not effectively returned to that layer. Also, the large hypolimnetic volume and short period of historic enrichment combined to prevent an anoxic condition (zero oxygen at the sediment-water surface) from developing, which would have allowed the increased content of sediment phosphorus to recycle to the water column. That process, known as internal loading, would have prolonged the recovery. Other lakes have responded to diversion of a large fraction of phosphorus input, but not to such a low equilibrium level or as quickly as observed in Lake Washington. Such slow response in most other lakes was primarily due to continued recycling from sediment, or internal loading (Cullen and Forsberg, 1988; Cooke et al., 1993; Welch and Cooke, 1993; Sondergaard et al., 2001).

Chlorophyll *a* (chl *a*), which is the green pigment in photosynthetic plants and is used universally as an index of algal biomass, decreased from a pre-diversion summer mean of 36 µg/L to a post-diversion mean of 6 µg/L, in proportion to the decrease in P. Transparency, which is a highly reliable measure of water clarity, increased from 1.0 m to 3.1 m, in proportion to the decrease in chl *a* (Edmondson and Lehman, 1981).

Changes in nitrogen (N) concentrations relative to P concentrations during eutrophication and recovery were also of interest. Before diversion, the N:P ratio in Lake Washington had declined to the point of N being more limiting to algae growth than P (i.e., N:P was less than 10:1). However, with the removal of sewage effluent (which has a low N:P ratio of ~ 3:1), the lake's N:P ratio increased to over 20:1, and P once again limited algae. These results from Lake Washington were instrumental in convincing the scientific community that P, not N or carbon, was the nutrient primarily responsible for the effects of eutrophication in freshwater (Edmondson, 1970).

The improvement in the lake's quality did not end with marked decreases in P and chl *a* and increase in transparency, but went through a biological transition starting with the recurrence of *Daphnia,* a zooplankton that eats algae (Edmondson and Litt, 1982). *Daphnia* returned in abundance in 1976 due to a prior decrease in one of its predators, *Neomysis*, a large crustacean (Murtaugh, 1981), and the filamentous cyanobacteria *Oscillatoria* that interfered with *Daphnia* filter feeding (Infante and Abella, 1985). As a result of a shift to more edible algae and reduced predation in the late 1970s, increased grazing by *Daphnia* on algae decreased chl *a* by 50% to 3 µg/L as a 4-year summer mean. Summer average transparency more than doubled to 7 m, with maximums ranging from 4.5 to 10.0 m, due to the algae reduction (Edmondson and Litt, 1982). Transparency continued to remain high into the 1980s, averaging 6.4 m from 1976 to 1985, while *Daphnia* remained abundant at about 10 animals/L (Edmondson, 1988).

Summer (June through September) chl *a* concentration, determined by King County, has remained at about the same low level from 1993 to 2001, averaging 2.7 µg/L. Transparency determined by King County during that 9-year period at the deep station (0852) ranged from 3.5 to 5.6 m, with a mean of 4.5 m. However, transparency determined at the deep station by University of Washington personnel during 1989 to 2001 was similar to that during the late 1970s and early 1980s, with a range of 5.1 to 7.8 m and overall mean of 7.1 m. The 7.0-m mean (4.5- to 10.0-m range) transparency reported by Edmondson and Litt (1982) from 1976 to 1979 is higher than expected from the trophic state equations using a chl *a* concentration of 3.1 µg/L as the basis for estimating transparency. This equation developed by Carlson (1977), which includes Lake Washington data, predicts a transparency of 3.6 m from a chl *a* of 3.1 µg/L. Other factors that might explain the difference between King County and University of Washington measured transparency will be discussed later in Section 4.1.2.

The algal species composition also changed dramatically during the periods of eutrophication and recovery. The typical nuisance cyanobacteria, represented by *Aphanizomenon* and *Anabaena*, had occurred during the early 1950s. The cyanobacteria *Oscillatoria*, which does not form floating mats, was first evident in great abundance in 1955 (Edmondson et al., 1956). When *Oscillatoria* largely disappeared, nearly 10 years after diversion, these nuisance taxa (especially *Aphanizomenon*) became relatively more abundant. However, *Aphanizomenon* and *Anabaena* have not reached the high level that *Oscillatoria* attained prior to diversion (Edmondson, 1994), due to the limiting low levels of P that exist today. These nuisance taxa have continued to be dominant members of the algae community during the 1990 through 2001 period.

The lake's response to increasing then decreasing enrichment was also reflected in the profundal (deep bottom) sediments (Shapiro et al., 1971). TP content in the sediments increased to around 6 mg/g from a background of 1 to 2 mg/g, which is typical of lakes in the area. By 1972, sediment TP content had decreased, but had not yet returned to background levels (Edmondson, 1994). Recent analysis of deep bottom sediments by King County from 1995 to 2002 showed a mean TP concentration of 0.745 mg/g (Coughlin, 2002 personal communication).

Hypolimnetic dissolved oxygen (DO) also decreased with increasing enrichment; DO declined due to the increased demand by sinking organic matter produced from increased enrichment. The areal hypolimnetic oxygen deficit rate (AHOD), which is a seasonal measure of that oxygen demand (see Section 4.2.1 for calculation), had reached a level of 810 mg/m^2-day in 1964. Pre-enrichment AHOD values are not available, but were probably much lower, because by 1974, AHOD had declined to 580 mg/m^2-day (Welch and Perkins, 1979b). The AHOD from 1993 to 2001 averaged 473 mg/ m^2-day. For perspective, a rate of 550 mg/m^2-day is often considered indicative of a eutrophic state (Mortimer, 1941).

Had Lake Washington's hypolimnion been smaller, anoxia would probably have resulted, with high rates of P internal loading, from the increased sediment P concentration. High AHOD rates (530 to 650 mg/m^2-day) do exist in shallow western Washington lakes that develop anoxic hypolimnia, such as Pine, Meridian, and Sammamish, with mean depths of 6, 12.5, and 18 m, respectively (Welch and Perkins, 1979). The fact that the hypolimnion of Lake Washington (mean depth 37 m) did not reach an anoxic state illustrates the importance of depth in the lake's quick recovery from nutrient enrichment; the oxygen reserve in the large hypolimnetic water volume exceeded the demand from increased organic matter.

Another significant historical change in Lake Washington has been in alkalinity, which is a measure of buffering capacity and is essentially $Ca(HCO_3)_2$ at the pH range in the lake. Alkalinity has increased by one third over a 35-year period, from about 0.6 meq/L to about 0.8 meq/L (30 to 40 mg/L as $CaCO_3$). That change was hypothesized to be a result of soil disturbance due to increased development within the watershed (Edmondson, 1994). The result was increased leaching of $Ca(HCO_3)_2$ from the exposed soil, resulting in higher alkalinity in the lake.

2.2. Comparison with Other Area Lakes

While Lake Washington reached a eutrophic state in the early 1960s from direct inputs of wastewater from ten wastewater treatment plants, it nonetheless recovered rapidly to a mesotrophic state that exists today. The key to such a rapid and complete recovery was the lake's depth, which prevented anoxia from developing in the hypolimnion. The lake's relatively fast flushing rate accelerated recovery. The lake's shape, depth, and oxic condition allowed for a high rate of retention (average 61%) of incoming TP by the sediments, which was maintained throughout the recovery period (Edmondson and Lehman, 1981). Lakes with high internal loading usually have negative retention for many years following reduction in external input (Sondergaard et al., 2001). If Lake Washington had half the hypolimnetic volume, anoxia would have occurred within the stratified period (see calculation in Section 4.2.1), yielding high P internal loading rates from the P-enriched sediment. As observed in Lake Washington, mean hypolimnetic DO remained above 4 mg/L throughout the stratified period in 1957 (Edmondson, 1966). Minimum hypolimnetic DO remained above 2.5 mg/L from 1990 to 2001. The nominal, off-bottom DO level below which phosphorus recycling is likely to occur is often cited as 1.0 mg/L (Nurnberg, 1995).

By way of comparison, P internal loading during summer was found to be more important than external loading (68 $\pm$ 21% of total) in 14 of 17 lakes examined from western Washington (Welch and Jacoby, 2001). Six of these 14 lakes stratify, and all are more shallow than Lake Washington. None has received wastewater in the past, and surficial sediment TP content was typically 1 to 2 mg/g, only 15 to 30% of the maximum concentration reached in Lake Washington sediment (Shapiro et al., 1971). Internal loading was important, even in unstratified lakes with no prolonged anoxia. The greater importance of internal than external loading during summer was due to the generally dry summer with low water input. Therefore, internal loading may also have been relatively important in Lake Washington had it been shallow enough to reach anoxia.

The importance of internal loading in many western Washington lakes would have been greater with higher external loading. Some of the lakes analyzed by Welch and Jacoby (2001) were in watersheds undergoing development, but none have had the high external loading from wastewater near what was the maximum input to Lake Washington (1.1 g TP/m^2-yr). With such high external loading to these shallower lakes, sediment TP content would have increased and the role of internal loading would have undoubtedly become even more important than indicated above, potentially prolonging recovery from any reduction in external load. Greatly prolonged recovery has been the case for most lakes in the world responding to wastewater diversion (Sondergaard et al., 2001).

Comparison of Lake Washington with other western Washington lakes illustrates that depth and the relatively short period of enrichment were instrumental in accounting for the rapid recovery of Lake Washington. However, that does not mean Lake Washington is insensitive to changes in phosphorus loading. Rather, the record of response through changes in algal abundance, algal species composition, zooplankton composition, and transparency is clear evidence of its sensitivity to increased and decreased phosphorus loading.

3. WATER COLUMN MONITORING BACKGROUND

Water column monitoring by King County is designed to account for natural seasonal changes in the water column as well as changes from anthropogenic (human) input. General water quality parameters (temperature, transparency, DO, conductivity, alkalinity, P, N, and chl *a*) are monitored at multiple depths. Below is a more detailed discussion of the water quality parameters sampled in Lake Washington.

3.1. Description of Water Quality Parameters

3.1.1. Temperature

Water temperature is an important water quality variable because it (1) directly affects biological and chemical activity, (2) affects water density, which determines water column stability, and (3) defines available habitat for a variety of aquatic species.

The seasonal pattern of temperature throughout the water column is determined largely by climatic factors. During winter, as in other temperate, monomictic lakes, temperature throughout the water column is relatively constant, because the lake is well mixed. The water column becomes stratified into a warm, less dense surface layer (or epilimnion), an intermediate metalimnion, and a colder, denser hypolimnion during summer. This stratified condition develops as increased solar radiation in the spring heats the surface water. The depth of mixing defines the bottom of the epilimnion and occurs where the wind energy exerted to mix the water column equals the energy of resistance due to the higher density. Because the epilimnion and hypolimnion do not mix during the summer-stratified period, chemical characteristics in the two layers may become quite different. In the fall, as the surface water cools and becomes more dense and windy conditions become more prevalent, thermal stratification begins to breakdown and relatively complete mixing eventually resumes.

3.1.2. Transparency

Water transparency, or clarity, was measured with a standard black-and-white metal Secchi disk that is 28 cm in diameter. The depth at which the disk disappears from sight is determined by attenuation of light penetrating through the water column. Light attenuation through the water column is influenced by several factors, including living plankton algae, non-algal turbidity from suspended sediment and organic detritus, and color. Therefore, the depth that the disk disappears decreases as the concentration of particles and the light they scatter and absorb increases.

Transparency of most lakes is dependent largely on the concentration of algal particles, especially in summer, which is usually the season used to indicate the state of lake quality and trophic state. Chlorophyll *a*, as an index of algal biomass, is inversely related to Secchi transparency (Carlson, 1977). As noted in Section 2.1, Lake Washington data were used to develop the Carlson trophic state index, so transparency in this large lake is primarily dependent on the concentration of living algae, especially during summer.

3.1.3. Dissolved Oxygen

Dissolved oxygen (DO) is an important constituent that directly affects, and is affected by, abundance and diversity of aquatic organisms. Vertebrate and invertebrate taxa have specific tolerances to low DO for metabolic needs. Water quality criteria for DO are often established to protect the reproduction and growth of sensitive species. Water bodies with DO near saturation levels (e.g., 9 mg/L at 20ºC) at all depths are capable of sustaining a diverse assemblage of aquatic organisms. As DO declines near the sediment surface, species more tolerant of low DO replace those that are less tolerant.

During summer stratification, DO concentrations may change dramatically with depth to the point of total depletion near the bottom sediments or even throughout the hypolimnion. DO is produced through photosynthesis and consumed through respiration in the epilimnion, but substantial depletion normally does not occur due to atmospheric reaeration, except possibly during the decline of large algal blooms or in dense, localized macrophyte beds. However, consumption can easily exceed supply in the hypolimnion, where photosynthesis and atmospheric reaeration are largely absent and settled organic matter is abundant.

The magnitude of the loss of DO in the hypolimnion is somewhat proportional to surface water algal production. Thus, the level of DO and the rate of its loss are used as an index of eutrophication or trophic state. As discussed in Section 2.1, a measure of DO depletion rate is the AHOD, which is the daily rate of DO loss per unit area of the hypolimnion.

3.1.4. Conductivity

Specific conductance (conductivity) is a measure of the capacity of water to conduct an electric current standardized to that capacity at 25 ^{o}C so comparisons can be made among waters of different temperatures. Temperature and the concentration of dissolved ions in water determines the conductivity of water. Because of the local predominantly igneous rock geology, water in the Puget Sound region generally has low levels of dissolved minerals and relatively low conductivity. In King County streams and lakes, conductivity generally averages less than 100 μmhos/cm during base flows (King County, 1996). Active land use and land-use conversion from open space to developed areas tend to increase conductivity, and increases indicate the presence of dissolved ions potentially from a pollutant source (e.g., nitrite-nitrate from fertilizers) (King County Lake Monitoring Program, 2002) or soil disturbance exposing potential dissolvable ions to storm water.

3.1.5. Alkalinity

Alkalinity of water refers to the presence of compounds that buffer changes in lake pH. Alkalinity in most lakes is imparted by the presence of bicarbonates, carbonates, and hydroxides, and is expressed in mg $CaCO_3$/L (Wetzel, 1983). Alkalinity of surface waters in western Washington is generally low due to the lack of sedimentary carbonate in the watersheds (Carroll and Pelletier, 1991). The pH in poorly buffered water often increases to high levels (> 10) during intense algal blooms when photosynthetic removal of CO_2 by algae is faster than replenishment from the atmosphere.

3.1.6. pH

Hydrogen ion activity in water is measured as the negative log of the hydrogen ion concentration (pH) and indicates the acidity of a lake; a pH of 7.0 is neutral. Because pH is inversely related to hydrogen ion activity, waters with a pH above 7.0 are alkaline and those with a pH below 7.0 are acidic. As discussed above, photosynthesis removes carbon (in the form of carbonic acid and bicarbonate) from the water and reduces the concentration of hydrogen ions, increasing pH levels. For this reason, pH is often higher at the surface during daylight hours in the summer, especially in low-buffered waters. Dense, rooted aquatic macrophyte communities can also increase pH during intense photosynthetic periods. Frodge et al. (1990) observed pHs greater than 10 in dense beds of milfoil in Lake Washington. Diffusion of CO_2 from the atmosphere, respiration, and decomposition lower the pH. Organic matter that settles onto the bottom of the lake and is decomposed contributes to differences in pH readings with depth in the lake. Water near the bottom and in surficial sediments usually has a pH around 6 due to bacterial decomposition of settled organic matter. However, most surface waters have a pH between 7.0 and 8.5, which is slightly alkaline. High-elevation lakes in the Cascade Mountains often have a pH below 7.0 due to poor buffering capacity and are therefore highly sensitive to acid precipitation.

3.1.7. Phosphorus

Phosphorus is an essential element for the metabolic processes of both plants and animals. It occurs naturally in soil and rock and can be found in plant and animal tissue as well as on particles in the atmosphere. Total phosphorus (TP) represents both organic and inorganic P in particulate and dissolved forms. Soluble reactive phosphorus (SRP) generally represents that portion of P (largely phosphate) that is dissolved in water and is readily available for biological uptake.

Phosphorus is important to algal growth and has historically been the nutrient most closely linked to the historical change in algal production in Lake Washington (see Sections 2.1 and 3.1.9). Because Lake Washington is P limited (see Section 3.1.9), increased availability of P could lead to increased algal blooms. Specifically, human activities within the watershed and direct discharge of treated sewage effluent increases the amount of P entering a lake and is often the cause of serious water quality degradation.

3.1.8. Nitrogen

Nitrogen exists in several forms in aquatic systems, including nitrite-nitrogen, nitrate-nitrogen, ammonium-nitrogen, organic nitrogen, and elemental nitrogen. Aquatic organisms commonly use the dissolved forms of nitrogen, ammonium-nitrogen, and nitrate-nitrogen. Total nitrogen (TN), nitrate plus nitrite, and ammonium-nitrogen were the forms of N historically sampled in Lake Washington. Although nitrate and nitrite nitrogen are often reported as one parameter, nitrate-nitrite nitrogen, this report refers to this parameter as nitrate-nitrogen due to environmental conditions in Lake Washington, which result in low nitrite concentrations. Lake Washington tends to be a P-limited system, therefore a small increase in nitrogen inputs would have little effect on the productivity of the lake (see Section 3.1.9). However, long-term changes in nitrogen to phosphorus ratios may forecast changes in phytoplankton community composition [e.g., Downing et al. (2001) Predicting cyanobacteria dominance in lakes. Can. J. Fish. Aquat. Sci. 58:1905-1908]. Also, long-term tracking of nitrogen may provide an understanding of some of the impacts of watershed activity on the lake. Input of N could affect water quality in Puget Sound, which is N limited.

3.1.9. Nutrient Limitation

Lake water quality problems are most often associated with an overabundance of nutrients, which can result in proportionately higher production of algae. Determining the limiting nutrient is important for controlling algal abundance and managing water quality problems. The limiting nutrient in lakes is typically N or P. In oligotrophic lakes with low productivity, P tends to be the nutrient in shortest supply and therefore the most limiting factor relative to algal production. As lakes become more enriched with P, relative to N, limitation tends to shift to N, as was the case in Lake Washington during the 1950s and 1960s (see Section 2.1). However, with the diversion of sewage effluent (and the resulting low N:P ratio), Lake Washington has returned to a P-limited system.

Nutrient ratios are usually expressed on a weight (mass) basis, e.g., µg TN:µg TP. Generally, if the TN to TP ratio (TN:TP) is greater than 16:1 (by weight) then the growth of algae in the lake is limited by P (Carroll and Pelletier, 1991). TN:TP ratios less than 5:1 (by weight) generally indicate that N is the limiting nutrient. Intermediate ratios indicate either nutrient may be limiting. The N:P ratio tends to indicate which nutrient is most limiting growth in the short term; however, algal biomass is usually linked most closely with TP regardless of the N:P ratio. This is true because N limitation favors N-fixing species, which are all cyanobacteria and are ultimately dependent on P. Hence, TP is the nutrient that is emphasized to manage lake quality (Welch, 1992). The Redfield TN:TP ratio of 16:1, calculated using the number of atoms, is approximately equivalent to 7:1 by weight.

Generally, if the molecular TN:TP ratio is greater than 16:1, then the algal productivity is considered limited by P availability (Carroll and Pelletier, 1991). Nutrient ratios are usually expressed on a weight (mass) basis, e.g., µg TN:µg TP. The Redfield TN:TP ratio of 16:1, calculated using the number of atoms, is approximately equivalent to 7:1 by weight.

3.1.10. Algae (Chlorophyll *a*)

Chlorophyll *a* is the photosynthetic pigment present in all algae and cyanobacteria. Chl *a* is used by these organisms in the process of photosynthesis, which converts light energy, carbon dioxide, and water to chemical energy stored in sugar. The ratio of algal biomass, or carbon, to chl *a* varies with species, nutrient availability, and environmental conditions. Thus chl *a* is not an exact measurement of algal biomass. Nevertheless, it is used universally as an indicator of algal biomass and lake trophic state.

3.1.11. Metals

Many metals naturally occur in surface waters, originating from the erosion of watershed soils, groundwater discharge, and atmospheric deposition (e.g., from windblown dusts, volcanogenic particles, and forest fires). Anthropogenic sources of metals to Lake Washington have included wastewater effluent, storm water, groundwater, atmospheric deposition, and boats. The fate of metals in the environment and resulting concentrations in lake water vary with solubility, biding affinity and sorption to particles, complexation with organic matter, sorption and desorption, biological uptake, and other chemical and biochemical properties and processes (Moore and Ramamoorthy, 1984a).

Many metals are important micronutrients for humans and other animals. However, elevated concentrations of certain metals may cause toxic effects to people, wildlife, fish, or other aquatic life (Moore and Ramamoorthy, 1984a). For example, lead is well known as a neurotoxin and is associated with skin disease and cancer (USEPA, 2002). At elevated concentrations, copper is toxic to most aquatic plants, algae, and many freshwater fish and invertebrate species. Although concentrations of metals associated with toxic effects have been reported in storm water and some urban streams of western Washington, metals toxicity has generally not been observed in regional lake water (MacCoy and Black, 1998).

The toxicity of many potentially harmful metals increases when the hardness or pH of the water decreases. Water hardness is primarily dependent on the concentration of calcium and magnesium carbonates. Metal ions can form insoluble precipitates with these carbonates, reducing the metal's availability for uptake by the organism (Blowers, 2002). The carbonates with which metals bind are alkaline, and a decrease in the ambient pH can dissolve the metal-carbonate precipitates or interfere with the metal's association with other lignins. This results in a greater proportion of the metal occurring in its ionized form, making it more available for ingestion or uptake by aquatic organisms. While both water hardness and pH can affect metal toxicity, water quality standards address only the effect of hardness on metal toxicity.

3.1.12. Organic Compounds

Organic compounds are carbon-based molecules; some examples include pesticides, volatile and semi-volatile chemicals, and polycyclic aromatic hydrocarbons (PAHs). Many of these chemicals persist in the aquatic environment long after their initial use (e.g., DDT and metabolites). Similar to metals, organic compounds also enter surface waters from natural and anthropogenic sources (e.g., coal combustion, forest fires). Organic compounds enter surface waters from municipal and industrial effluents, storm water, pesticide applications, leaks and spills, contaminated groundwater, seepage from older uncontrolled landfills and contaminated soils, and atmospheric deposition. Lake-water concentrations are determined by inputs from these sources and the fate and transport processes, such as sorption-desorption processes, volatilization, and chemical and biological transformations (Moore and Ramamoorthy, 1984b). As with all chemicals, when present in sufficiently high concentrations, exposure to toxic levels of organic compounds may cause adverse effects to people, wildlife, fish, or other aquatic life. Organic compounds have been frequently detected in water and sediments of urban streams, lakes, and estuaries of western Washington (i.e., PAHs and certain phthalate esters) (Bortleson and Davis, 1997; MacCoy and Black, 1998). However, there is a lack of data regarding organic chemical contamination and subsequent toxicity within lake waters of this region.

Recently, a number of organic compounds classified as "endocrine disrupters" have become a cause for concern. The U.S. Environmental Protection Agency (USEPA) defines endocrine-disrupting chemicals as substances that interfere with the production, release, transport, metabolism, binding, action, or elimination of natural hormones in an organism that are responsible for the maintenance of homeostasis and regulation of developmental processes. Current research suggests that wastewater effluent may be a potential source of endocrine-disrupting chemicals to the environment. King County is currently in the process of beginning to monitor some of these chemicals in ambient water.

3.2. Water Column Sampling Methods

The Major Lakes Monitoring Program was designed to monitor long-term trends and seasonal water quality in Lakes Washington, Sammamish, and Union. These changes are accounted for by monthly and bimonthly sampling at all stations. Rainfall patterns, changes in sunlight intensity, and day length all combine to generate seasonal cycles in the lake. These seasonal water quality cycles are not uniform at all depths in the lake, so at each station samples are collected from 1 m below the surface of the lake to just above the lake bottom.

3.2.1. Field Methods

Grab (instantaneous) samples for alkalinity, nutrients, and chl *a* were collected at various depths in the water column using Vandorn bottles at the shallow stations and Niskin bottles at the deeper, open water stations. Bacteria samples were also collected, primarily at the surface of the lake, but also periodically at depth. Variables measured in the field (pH, temperature, DO, and conductivity) were measured using a Hydrolab probe lowered to various depths at each station. Secchi depths were measured at each station using a 28-cm-diameter black-and-white Secchi disk.

3.2.2. Laboratory Methods

With the exception of field measurements, water column variables were analyzed at the King County Environmental Laboratory (KCEL). Laboratory methods and detection limits are provided in Table 3. Additional information about the KCEL can be obtained at the laboratory's website [http://dnr.metrokc.gov/wlr /envlab/index.htm].

All samples were analyzed within their respective holding times, and quality assurance/quality control procedures included the use of blanks, duplicates, and spikes where appropriate. All data were reviewed before entry into the Laboratory Information Management System (LIMS) database.

Table 3.
Laboratory Methods and Detection Limits for Water Samples[a]

Parameter	Standard Methods	MDL* (mg/L)	RDL** (mg/L)
Alkalinity	SM 2320-B	0.2	1
Chlorophyll *a*	SM 10200-H	0.01 mg/m^3	0.05 mg/m^3
Ammonia-Nitrogen	SM 4500-NH3-H	0.02	0.04
Total Nitrogen	SM4500-N-D + SM4500-NO3-F	0.05	0.1
Nitrate/Nitrite	SM4500-NO3-F	0.05	0.1
Soluble Reactive Phosphorus	SM 4500-P-F	0.002	0.05
Total Phosphorus	SM 4500-P-B,E	0.005	0.01
Turbidity	SM 2130-B	0.5 NTU	2 NTU

a Taken from King County Environmental Laboratory, 2002
* Method Detection Limit
** Reporting Detection Limit

4. SUMMARY OF 1990 TO 2001 MONITORING DATA

This section summarizes the monitoring data and discusses their significance to provide the reader with a descriptive perspective of the condition of Lake Washington. Specifically, the water quality data were analyzed with the following objectives:

- To characterize the current status of the lake relative to accepted ecological indicators, such as transparency, DO, TP, and chl *a*.
- To identify water quality trends during the study period, with reference to historical conditions where applicable.
- To identify water quality differences between nearshore and pelagic areas of the lake.
- To provide information to be used in making future environmental management decisions that may impact the lake.

All data were assessed to define vertical and horizontal differences by first examining each parameter by station and depth, then grouping the stations by nearshore and pelagic regions of the lake. To characterize the lake as a whole, volume-weighted averages (averages that take into account the specific volume of water that a sample represents) were calculated where data were available. Whole-lake, nearshore, pelagic, epilimnion (0 to 20 m), and hypolimnion (25 to 60 m) volume-weighted averages were calculated for P and N parameters. See Appendix A for tables summarizing annual means and standard deviations for all stations and parameters.

Monthly volume-weighted averages were tested to see whether the data were normally distributed or log-normally distributed. If the data were determined to not have a normal distribution, the data were presented arithmetically for means and standard deviations and non-parametric tests applied for trend analysis. All other parameters were also tested for normality but not volume weighted. Normality test results can be found in Appendix D. All data were analyzed for year-to-year differences during the study period and within seasons. Seasons were defined as winter (January through March), spring (April through June), summer (July through September), and fall (October through December). Tables 4 and 5 present a summary of whole-lake, nearshore, and pelagic averages and ranges for the 1990 through 2001 Lake Washington water quality monitoring data. Table 6 summarizes the results of the trend analysis performed for each parameter. Data collected at the deep station, 0852, is used to represent the overall water column profile characteristics of the lake. Station 0852 is the same location as the long-term study site used by Edmondson at the University of Washington.

Data collected from 1990 through 2001 indicate that the quality of Lake Washington's water supports beneficial uses such as direct water contact recreation, fishing, wildlife, and fisheries as defined by WAC 173-201A. Some of the major findings are as follows:

- Temperature of Lake Washington ranged from 7º to 9ºC in January during the period of complete mixing every year. The maximum temperature in both nearshore and pelagic water was between 21.5ºC and 24.5ºC without an increasing trend. From 1993 to 2001 there was an increasing trend in seasonal and annual average water temperatures (epilimnetic and whole lake) that may be attributed to global climate change-related increases in air temperatures. The effect of this trend on lake biota is currently unknown.
- Transparency has remained consistent from year to year, with the 10-year lake-wide annual average of 4.6 m and the mean summer transparencies ranging from 3.5 to 5.6 m.
- DO concentrations indicate that Lake Washington is mesotrophic, which is an improvement from the 1950s and 1960s when it was eutrophic.
- Annual whole-lake volume-weighted mean TP concentrations ranged from 10 to 18 µg/L and were lower in the last 4 years of the study. The TP concentrations in the lake are indicative of a mesotrophic condition. The 10-year annual mean TP was 14 µg/L. External loading of P determines P concentrations in the lake. Internal loading of P is not a significant part of the P cycle in the lake.
- The annual whole-lake TN mean concentrations ranged between 175 to 340 µg/L.
- N:P ratios were above 7:1, ranging from 13:1 to 30:1, indicating P limitation.
- The annual chl *a* 12-year mean was 3.4 µg/L, with a summer 12-year mean of 2.4 µg/L. These concentrations indicate that the lake is mesotrophic.

Lake Washington appears to be in stable ecological condition with respect to water quality following the pre-sewer diversion period of over-enrichment. The lake is sensitive to P loading, and the maintenance of present day water quality is dependent on P loading remaining at or near current levels. Currently, the low P input from the largest source of water to the lake, the Cedar River, is key to maintaining lake quality. Maintenance of the generally rural lower reaches and the protected upper watershed is critical.

Table 4. Summary of Nutrient and Dissolved Oxygen Data, Including Study Period Annual Volume-Weighted Whole-Lake, Nearshore, and Pelagic Means, Ranges, and Seasonal Means Where Applicable

Parameter	Study Period Annual Volume-Weighted Mean			Range of Volume-Weighted Annual Means	Study Period Seasonal Volume-Weighted Mean							
	Whole-Lake[1] 1992-2001	Nearshore 1990-2001	Pelagic[1] 1992-2001		Whole-Lake 1992-2001				Nearshore 1990-2001			
					W	Sp	S	F	W	Sp	S	F
Stratified Hypolimnetic Dissolved Oxygen, mg/L	n/a	n/a	8.6	8.9-7.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total Phosphorus, µg/L	14	19	13	10-25	16	14	13	15	27	21	17	15
Soluble Reactive Phosphorus, µg/L	6	6	6	2-11	8	4	5	7	11	4	4	5
Total Nitrogen[2], µg/L	278	335	267	160-390	287	288	273	277	458	371	249	279
Nitrate-Nitrite, µg/L-N	162	148	163	99-215	193	149	144	161	302	138	50	99
Ammonium-Nitrogen, µg/L	14	17	13	3-29	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

W = winter, Sp = spring, S = summer, F = Fall

[1] Water samples were not collected at deep stations before 1992; therefore, whole-lake and pelagic means were not calculated in 1990 or 1991.

[2] Total nitrogen samples were not collected until spring of 1993. therefore, there is no 1992 data or winter of 1993 data.

Table 5. Summary of Non-Nutrient Data, Including Study Period Annual Whole-Lake, Nearshore, and Pelagic Means and Ranges

Parameter	Study Period Annual Mean			Range of Annual Means
	Whole-Lake[1] 1992-2001	Nearshore 1990-2001	Pelagic[1] 1992-2001	
Temperature, °C	12	13	12	11-15
Secchi depth[2], m	4	4	5	4-5
Conductivity[3], µmhos/cm	n/a	n/a	n/a	60-173
pH[3]	n/a	n/a	n/a	6.4-9.2
Alkalinity, mg/L $CaCO_3$	n/a	n/a	36[4]	26-46
Chlorophyll *a*, µg/L	3	4	3	2-5

1 Water samples were not collected at any deep stations before 1992; therefore, whole-lake and pelagic means were not calculated in 1990 or 1991.

2 June to September Secchi depths were used to calculate annual means and the study period annual mean.

3 Annual, seasonal, and study period means were not calculated for conductivity and pH; only ranges were determined.

4 Annual mean alkalinity was only calculated for Station 0852.

Table 6. Summary of Statistical Data Analysis for Long-term Trends and Comparison of Nearshore Versus Pelagic Sites[a]

Parameter	Long-term Trend Analysis			Comparison Nearshore vs. Pelagic[b]	Seasonal Difference[b]
	Whole-Lake (n)	Nearshore (n)	Pelagic (n)		
Annual Mean Temperature (1993 to 2001)	+(9)[c]	+(9)[c]	+(9)[c]	No difference	n/a
June-Sept. Mean Secchi Transparencies (1990-2001)	0(10)[c]	0(10)[c]	0(10)[c]	No difference	Fall different from winter and spring
Stratified Period Hypolimnetic Dissolved Oxygen (1993-2001)	n/a	n/a	0(6)[b]	n/a	n/a
pH	n/a	n/a	n/a	No difference	n/a
Annual Mean Total Phosphorus (1993-2001)	-(9)[c]	0(9)[c]	-(9)[c]	Nearshore > Pelagic	n/a
Annual Mean Soluble Reactive Phosphorus (1993 to 2001)	-(12)[b]	-(12)[b]	-(12)[b]	No difference	n/a
Annual Mean Total Nitrogen (1993-2001)	0(9)[c]	0(9)[c]	0(9)[c]	Nearshore > Pelagic	n/a
Annual Mean Nitrate/Nitrite-Nitrogen (1990-2001)	0(9)[b]	0(9)[b]	0(9)[b]	No difference	n/a
Annual Mean Ammonium-Nitrogen (1993-2001)	0(12)[b]	0(12)[b]	0(12)[b]	No difference	n/a
Annual Mean TN:TP Ratios (1994-2001)	+(8)[c]	n/a	n/a	n/a	n/a
Annual and Seasonal Mean Chlorophyll *a* (1990-2001)	0(9)[c]	0(12)[c]	0(9)[c]	No difference	Spring higher

[a] Increasing trend is designated by "+", no trend by "0" and decreasing trend by "-". Numbers in parentheses (n) indicate the number of samples.

[b] Statistical trends were determined using an ANOVA test. Annual means, monthly means, and/or seasonal means were used to determine a trend or difference.

[c] Statistical trends were determined using the Kendall rank correlation test. Annual means were used to determine a trend.

4.1. Physical Conditions

4.1.1. Temperature

Lake Washington is a monomictic lake that is isothermal and undergoes complete mixing from the surface to bottom during December through March. In April, the lake begins to stratify, and by June it is strongly stratified and remains so until October. At this time, surface water cools and stratification of the lake starts to weaken until the thermal stratification that physically separates the surface waters from the deeper waters breaks down, allowing the entire water column to mix. The 9-year period of record for the temperature data is presented in Figure 4 for the deep station (0852). Data illustrated in this figure are typically representative of vertical stratification and mixing patterns within the lake. The temperature patterns observed at this station and illustrated in Figure 4 are similar to the pattern observed at the other stations. The minimum recorded temperature between 1990 and 2001 was 5.2ºC, indicating the lake does not freeze. Historical data, as well as data shown in Figure 4, indicate that the lake is completely mixed in January at a temperature between 7º and 9ºC.

Figure 5 presents the annual maximum temperatures recorded from 1990 through 2001. No difference in high temperatures was found between nearshore and pelagic areas, nor was there a trend toward increasing or decreasing annual maximum epilimnetic temperatures ($p < 0.05$). However, an increasing trend was found for annual mean temperatures for whole-lake, nearshore, and pelagic areas between 1993 and 2001 ($p < 0.05$, $n = 9$, annual means). No trend was identified between 1992 and 2001for the same areas ($p < 0.05$, $n = 10$, annual means). As seen in Figure 6, the mean annual temperatures for whole-lake, nearshore, and pelagic areas have standard deviations that are overlapping between years. Several more years of monitoring will be required to quantify if any long-term warming trend exists.

The seasonal temperature means shown in Figures 7 and 8 indicate that temperatures throughout the lake were below critical levels for salmonid species (17.8ºC; Kerwin, 2001) for fall, winter, and spring. Summer means for the nearshore area from 1990 through 2001 and in 1992 for the pelagic area did exceed 17.8ºC. However, the majority of pelagic summer means were less than 16ºC. The temperature in the nearshore areas between the surface and 9 m depth exceeded 17.8ºC from mid-July through early October most years, perhaps limiting fish utilization of these areas at these times.

At any given time, the majority of the water volume is between 6º and 9ºC. Below 25 m, the water temperature is rarely greater than 10ºC and is often less. The high temperature on the surface was 24.5ºC during the study period.

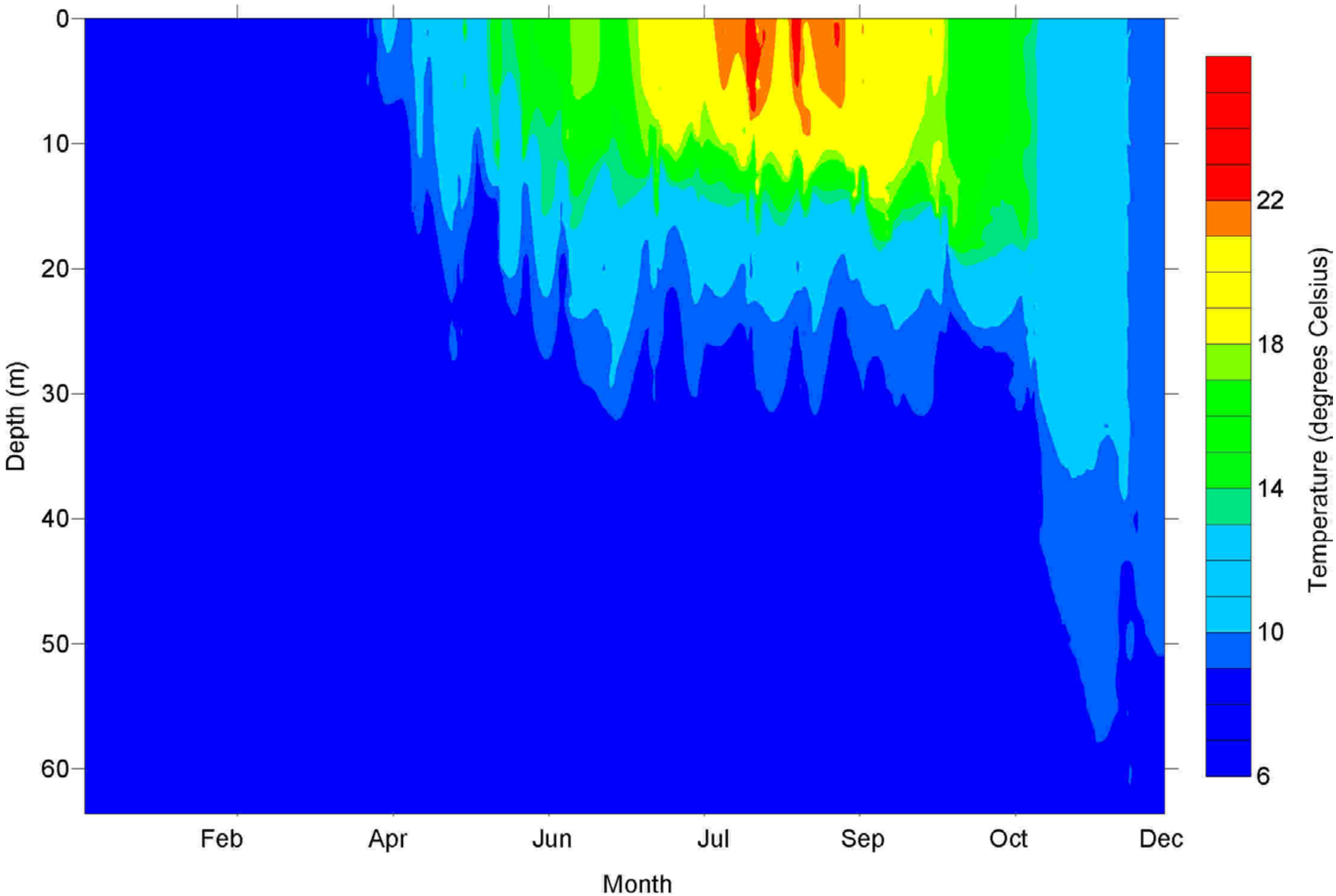

Figure 4. Annual Temperature Profile of Lake Washington Based on a Combined 9-Year Period of Record From 1993 to 2001 at the Deep Lake Station (0852)

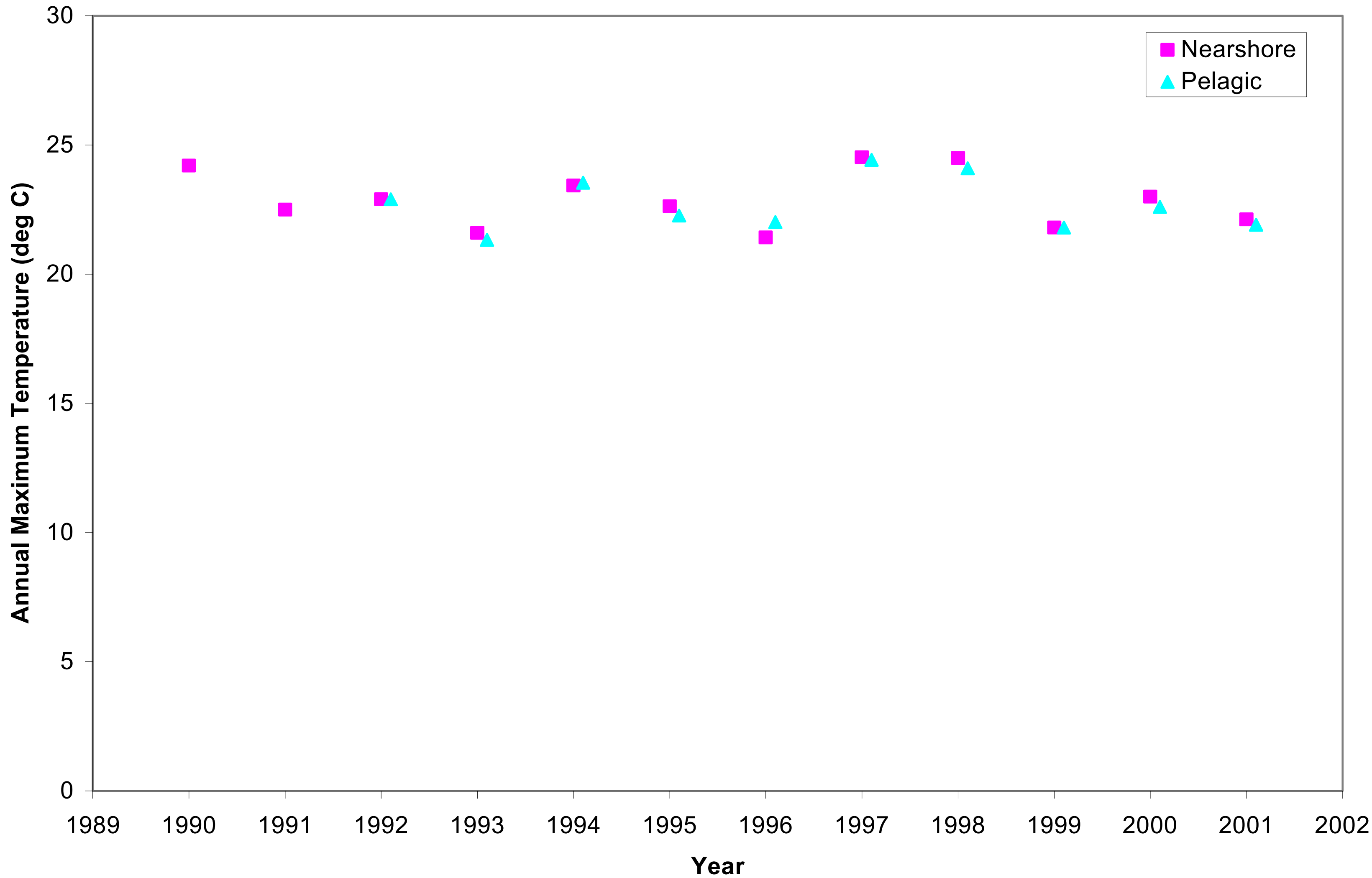

Figure 5. Annual Maximum Recorded Temperature in the Epilimnetic Waters of Lake Washington From 1990 to 2001

Note: Means are arithmetic.

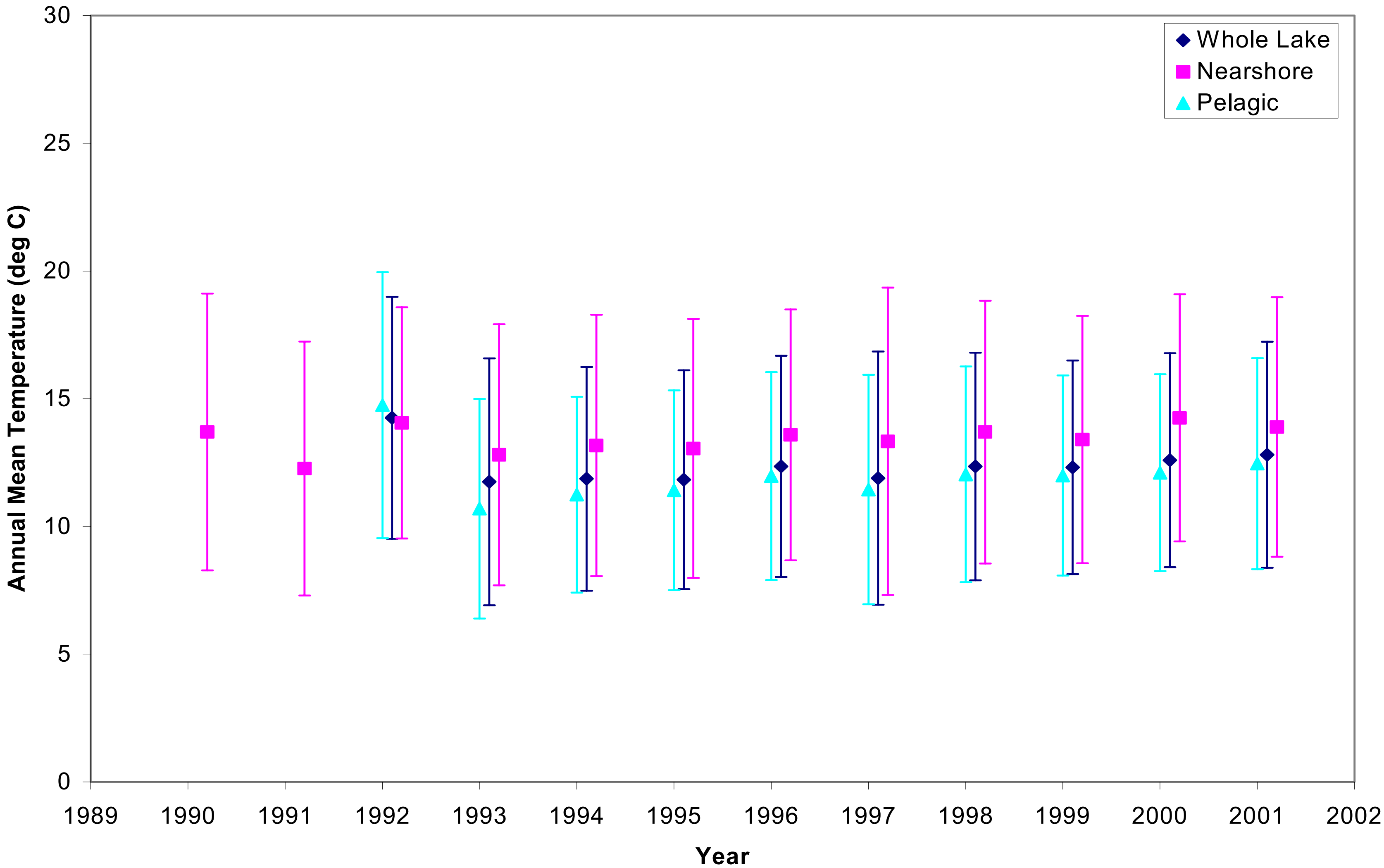

Figure 6. Annual Mean Whole-Lake, Nearshore, and Pelagic Temperature for Lake Washington From 1990 to 2001

Note: Means +/- SD are arithmetic.

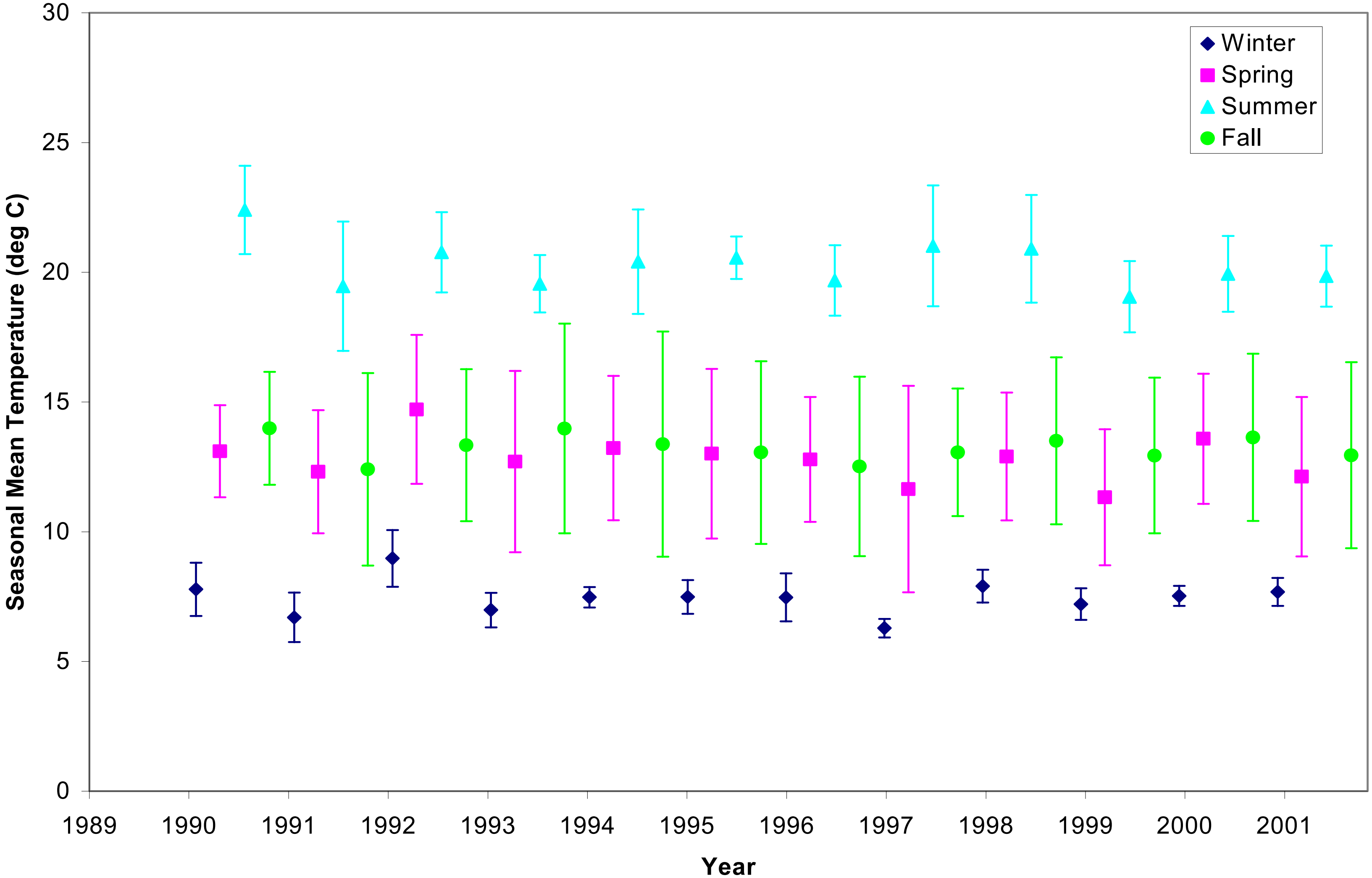

Figure 7. Seasonal Mean Temperature for Lake Washington Nearshore Areas From 1990 to 2001

Note: Means +/- SD are arithmetic.

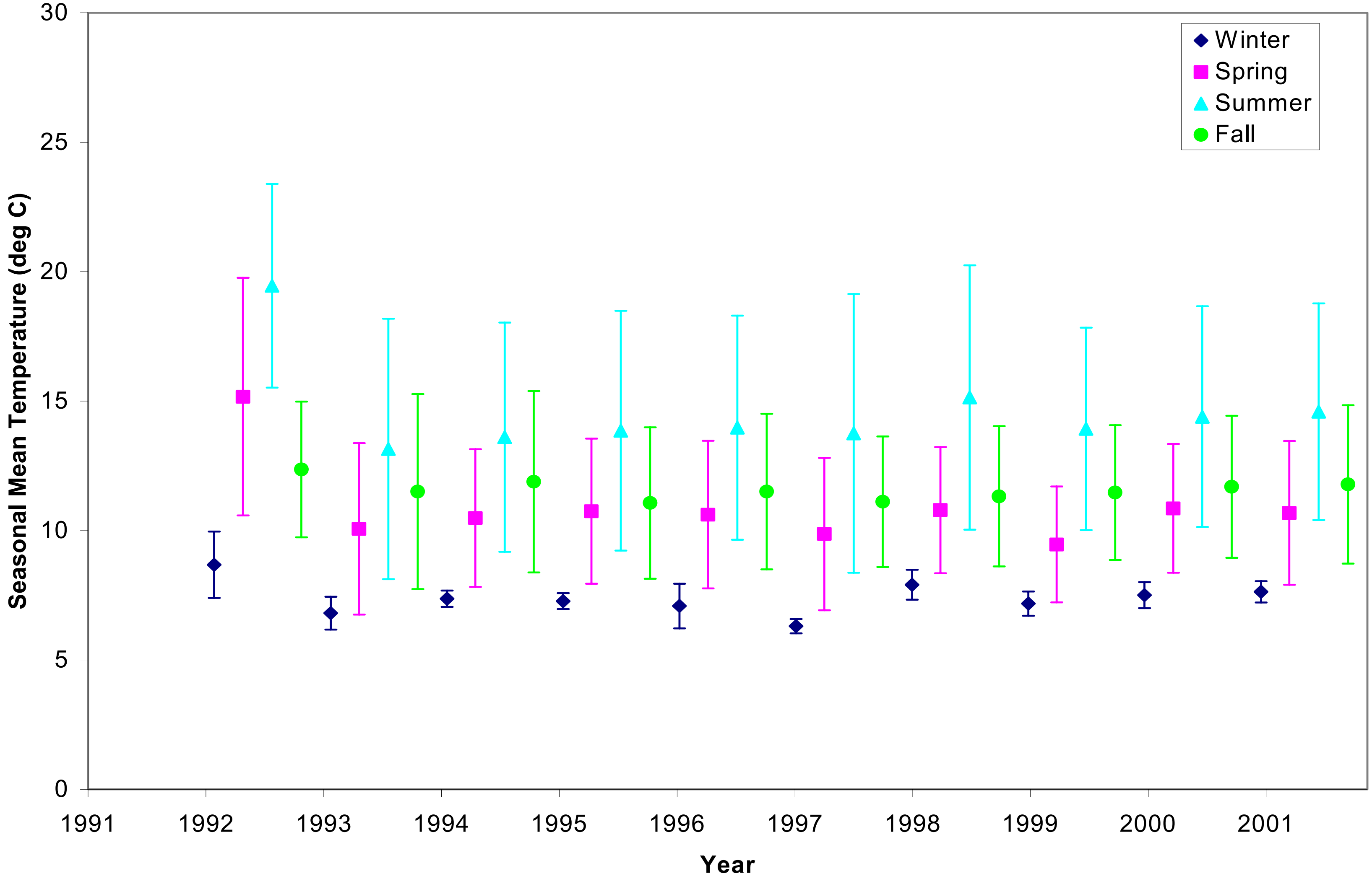

Figure 8. Seasonal Mean Temperature for Lake Washington Pelagic Areas From 1992 to 2001

Note: Means +/- SD are arithmetic.

4.1.2. Transparency

Mean summer (June through September) transparency in the pelagic areas of Lake Washington ranged from 3.5 to 5.6 m from 1992 to 2001, with a 10-year mean of 4.6 m at the pelagic stations (Figure 9). Transparency data for June through September (rather than July through September) were used so that recent King County measurements could be compared with past data from University of Washington investigators. Mean transparency in the pelagic area for July through September was nevertheless the same as June through September. Means from the nearshore stations were slightly less, by 0.1 to 0.5 m, than those in the pelagic area. However, that difference was not statistically significant ($p < 0.05$). Greater transparency in the deep, pelagic area is expected given that nearshore areas are closer to inflows as well as being subject to bottom disturbance from wind and wave action.

Except for 1999, summer mean transparencies in the pelagic area were greater in 3 of the last 4 years, by an average of about 1 m, than the early part of the decade (Figure 9). However, given the year-to-year variation of over a meter, a longer time period is needed to determine if a trend toward greater transparency is actually occurring. An ANOVA did not show that the summer means for these years (1998, 2000, and 2001) were significantly greater ($p < 0.05$, $n = 4$, summer monthly means) than summer means in the previous years. A Kendall rank correlation test ($n = 10$, annual means for the 10-year period, $p < 0.05$) also showed no trend to greater transparency in the pelagic area of Lake Washington.

Whole-lake mean transparency in the fall was usually greater than for other seasons. Summer transparency (July through September) was also greater than in winter and spring, and in most years summer transparency was similar to fall (Figure 10). Fall transparency was significantly different from winter and spring (ANOVA; $p < 0.05$, $n = 10$, seasonal means for 10-year period), but not significantly different from summer means (ANOVA; $p < 0.05$, $n = 10$, seasonal means for the 10-year period). Inflows carrying non-algal particulate matter are generally less during summer and fall. Also, stratification during summer and early fall allow the settling of algal and non-algal material from the epilimnion without replenishment from bottom waters. The opposite process, (i.e., complete mixing and higher inflows), occurs during winter and spring, so this seasonal variation was expected. The largest algal increase usually begins in March. Trends are not evident for any season given the year-to-year variation, as is the case for pelagic or nearshore stations when treated separately.

There is an observable difference between transparency measurements by the Department of Zoology, University of Washington (UW) and King County at the deep station, 0852 (Figure 11). The UW measurements were consistently greater by an average of 1.9 m than those measured by King County from 1993 to 2001. The 9-year mean measured by UW was 6.5 m compared to 4.5 m by King County. A difference of that magnitude is much greater than expected from random sampling error, and indicates a bias in methods. Secchi measurements vary among individuals under constant conditions by a few tenths of a meter at most (visual acuity varies). The consistently higher UW measurements are probably too great to be due to sample frequency, which was twice per month by UW and has ranged from once to twice per month by King County. One factor that may account for the difference is the distance from the water surface to the reader's eye, which is less than 1 foot by UW and about 5 feet by King County, due to differences in boat gunnel height. Viewing distance and variability of marked eye measurements has been addressed by Smith (2001), and he concluded that a view box is needed to reduce variability between measurements. However, that effect has not been examined by King County (Droker, 2002 personal communication). UW uses an all white disk for historical consistency, while King County uses the more standard black and white disk, which should provide more contrast and, hence, sensitivity and accuracy. However, a direct comparison elsewhere showed that measurements with a white disk were greater than a black and white one, but only by a few tenths of a meter (Carlson, 2002 personal communication). Both techniques resulted in means that were greater than 3.6 m, which is the threshold for mesotrophic versus eutrophic conditions (Carlson, 1977).

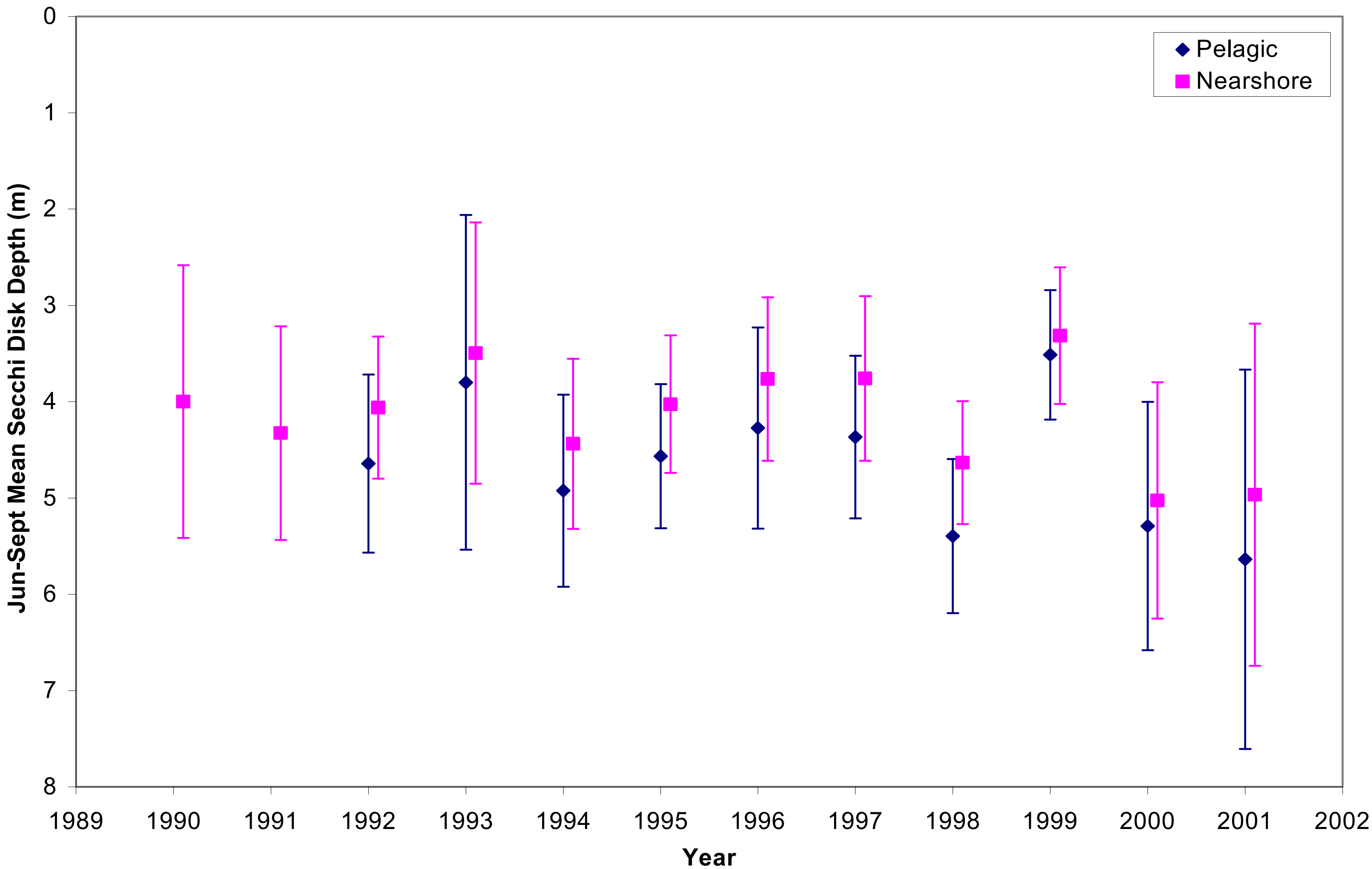

Figure 9. June Through September Mean Transparency (Secchi Depth) in Lake Washington From 1990 to 2001

Note: Means represent five pelagic and seven nearshore stations and are +/- SD.

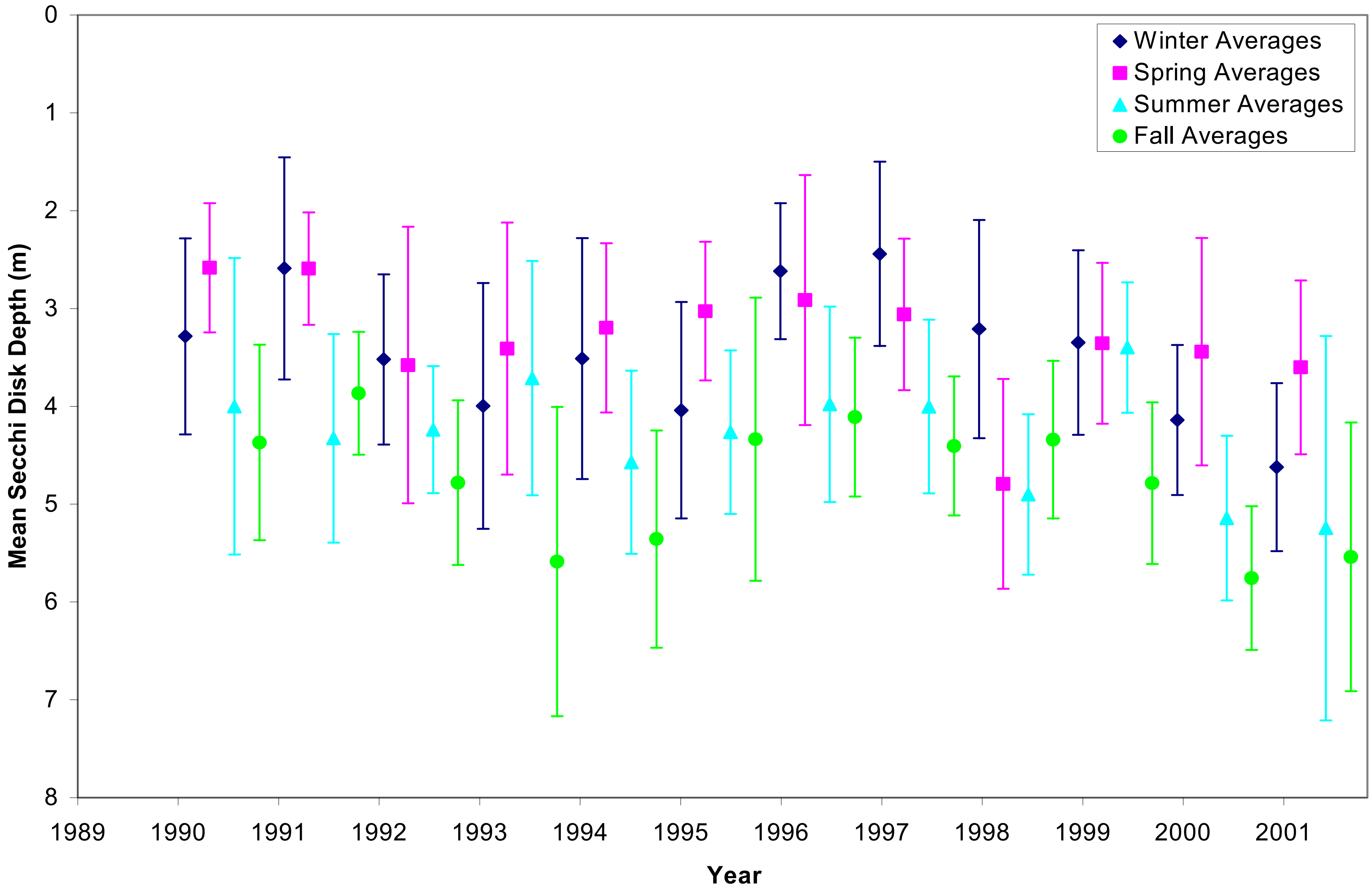

Figure 10. Seasonal Mean Transparency for All 12 Stations in Lake Washington From 1990 to 2001

Note: Means +/- SD.

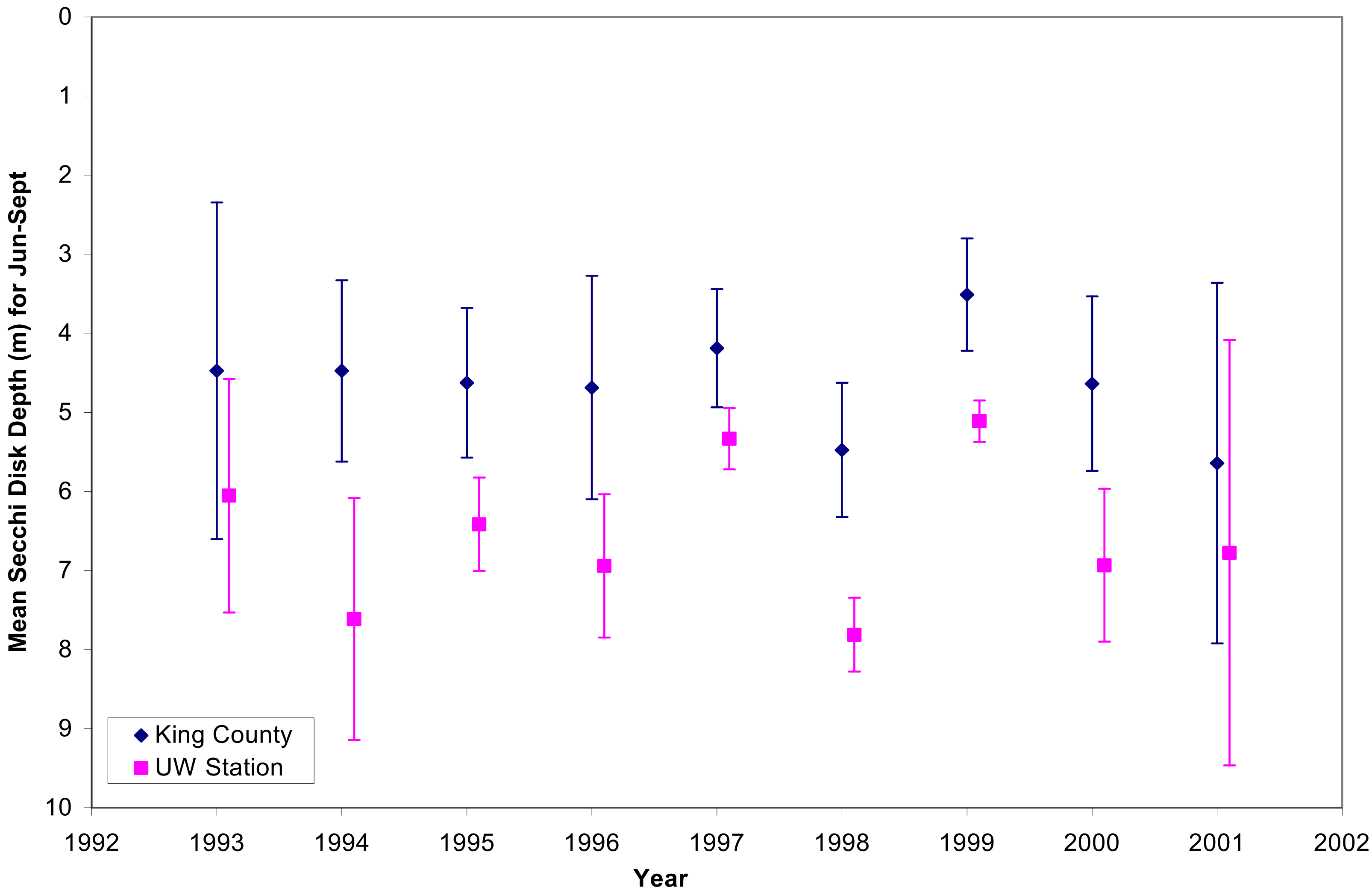

Figure 11. Comparison of June Through September Mean Transparency Measured by the University of Washington Department of Zoology and King County DNR at the Deep Station (0852) in Lake Washington From 1993 to 2001

Note: Means +/- SD.

4.2. Chemical Conditions

4.2.1. Dissolved Oxygen

DO concentrations have been recorded in Lake Washington for more than 50 years. Hypolimnetic DO has proven to be a sensitive indicator of the lake's condition, whereas epilimnetic DO has not been as useful a predictor of trophic state. DO in the epilimnion of stratified lakes is either near saturation with the atmosphere, or it varies greatly over diurnal periods if the lake is highly enriched. Epilimnetic DO concentrations in Lake Washington determined from mid-day during the 1990s were near saturation and confirm that the lake is no longer highly enriched. Beyond that, epilimnetic DO measurements are of limited use as a long-term index of water quality conditions.

Hypolimnetic DO concentration (concentrations measured at > 25 m during stratification) and areal hypolimnetic oxygen deficit rate (AHOD) are excellent indicators of lake condition, and the latter is also an index of trophic state (see Section 4.4). Specifically, AHOD is a measure of the oxygen depletion rate in the hypolimnion per sediment area per day and is expressed as mg DO/m^2-day. The greater the AHOD, the more eutrophic (enriched) the lake. The lower the AHOD, the more oligotrophic the lake. Lake Washington's AHOD was calculated for the stratified period (May through October) from 1993 to 2001. (DO data were insufficient to calculate AHOD from 1990 to 1992.) The AHOD rate was determined by multiplying the slope of the line defining the best fit for values of volume-weighted, hypolimnetic DO concentration related with time (g DO/m^3-day) by the hypolimnetic zone (> 25 m) mean depth (19 m). The resulting AHOD has units of g DO/m^2-day; multiplying by 1,000 mg/g gives mg/m^2-day. Arithmetic means were used for calculating AHOD, because that is conventional procedure, and May through October DO concentrations were normally distributed.

From 1993 to 2001, hypolimnetic mean DO ranged from 7.7 to 8.9 mg/L, and AHOD ranged from 285 to 564 mg/m^2-day (Figure 12). The 9-year mean AHOD was 473 ± 89 mg/m^2-day. Neither the calculated AHOD nor the hypolimnetic mean DO show an observable trend during this period, nor do statistical tests show a significant difference among annual stratified-period mean DO concentrations (ANOVA; $p < 0.05$, $n = 6$, stratification monthly means). AHOD values are single values for each year, and thus have no variance, which is needed for statistical testing. Because the within-year, stratified-period hypolimnetic DO variability was high, the stratified-period DO means did not exhibit a significant difference among years.

A rate of 550 mg/m^2-day or greater was suggested to indicate a eutrophic state by Mortimer (1941). That criterion was recently reevaluated and set at 400 mg/m^2-day (Nurnberg, 1996). Hence, Lake Washington can be considered mesotrophic or eutrophic from the standpoint of its AHOD, depending on criteria used. Although there appears to be no trend in AHOD during this last 11-year period of interest, there was a substantial decrease since the pre-diversion and early post-diversion years. The recent values are about half the high rate prior to wastewater diversion; AHOD in 1964 was 810 mg/m^2-day (Welch and Perkins, 1979b). In addition, the AHOD values from 1993 to 2001 were less than in 1974 (580 mg/m^2-day), estimated 7 years after wastewater diversion was complete. This decrease was not evaluated statistically due to the limited number of historical values.

There are two important advantages in using AHOD as an indicator of lake quality:

1. AHOD determines the oxygen demand rate in the hypolimnion due to bottom sediments and settled particulate matter, both largely the result of algal production of organic matter in the epilimnion and littoral regions.
2. AHOD normalizes for hypolimnetic depth by expressing the rate in areal units to enable lake-to-lake comparison, regardless of DO concentration.

The second advantage of using AHOD is especially pertinent to Lake Washington and explains why anoxia did not develop in the lake prior to wastewater diversion. Prior to diversion, the volumetric rate of DO depletion was 0.043 mg/L-day (AHOD of 810 mg/m^2-day/19 m). At that rate, zero DO throughout the hypolimnion would be reached in 233 days, although anoxia would have occurred sooner near the sediment surface. Anoxia did not result because stratification did not persist for that long. Lake Washington remains stratified for 150 to 180 days. However, if hypolimnetic depth were only half of 19 m, anoxia would have been reached in 116 days, sooner near the bottom, and easily within the stratified period.

For comparison, AHOD in Lake Sammamish declined from a mean of 423 mg/m^2-day before and shortly after wastewater diversion (1968) to a mean of 312 mg/m^2-day from 1974 to 1984, but it continues to experience anoxia each year (Welch et al., 1996). The reason Lake Sammamish reaches anoxia, but Lake Washington does not, is its shallower mean depth, which is half that of Lake Washington. So there is half the hypolimnetic volume and half the DO to oxidize organic matter settling through the water column and accumulated in the surficial sediment. As a result, Lake Sammamish goes anoxic every summer in spite of the lake having a lower AHOD than Lake Washington.

The Lake Washington hypolimnion remains oxic during the stratified period as shown by isopleths of DO for all data from 1993 to 2001 (Figure 13). Minimum DO observed near the bottom did not drop below 2.5 mg/L. This indicates that the sediment-water interface did not go anoxic. At a level of DO >2.5 mg/L above the sediment-water interface, the potential for P release from sediment is minimized by maintaining P in a bound form with iron. Also of interest in Figure 13 is the high epilimnetic DO during March and April. The high DO signifies that mild supersaturation occurred in the range of 110-120%, a result of the photosynthetic activity of the spring algal bloom. The figure illustrates that high DO concentrations occurred at a depth of 30 m or more in the spring. Water column mixing at that time probably carried the supersaturated water, which was produced in the photic zone, to depths well below the photic zone.

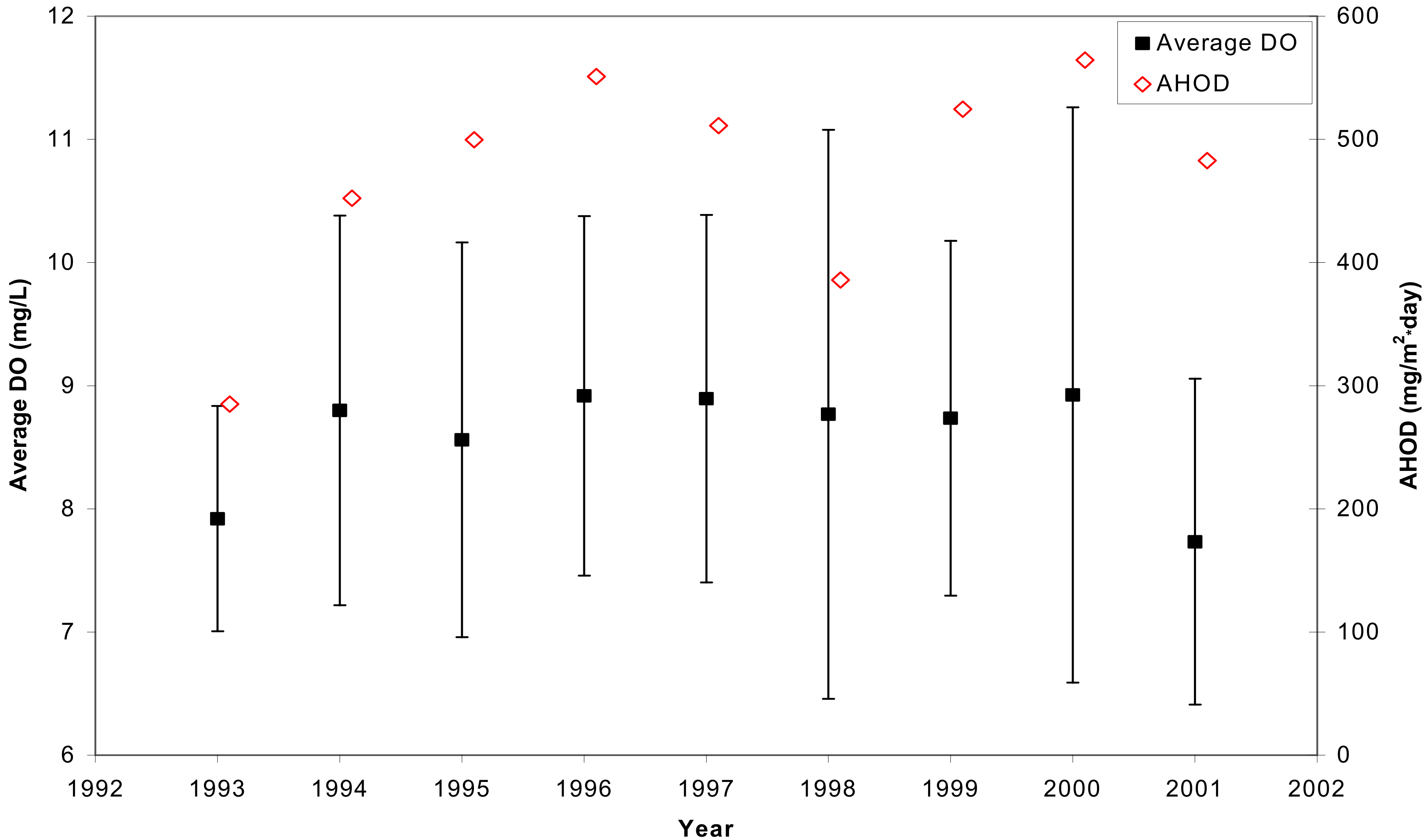

Figure 12. Mean AHOD and Dissolved Oxygen Concentration (+/- SD) in the Hypolimnion of Lake Washington for Periods of Stratification (May Through October) From 1993 to 2001

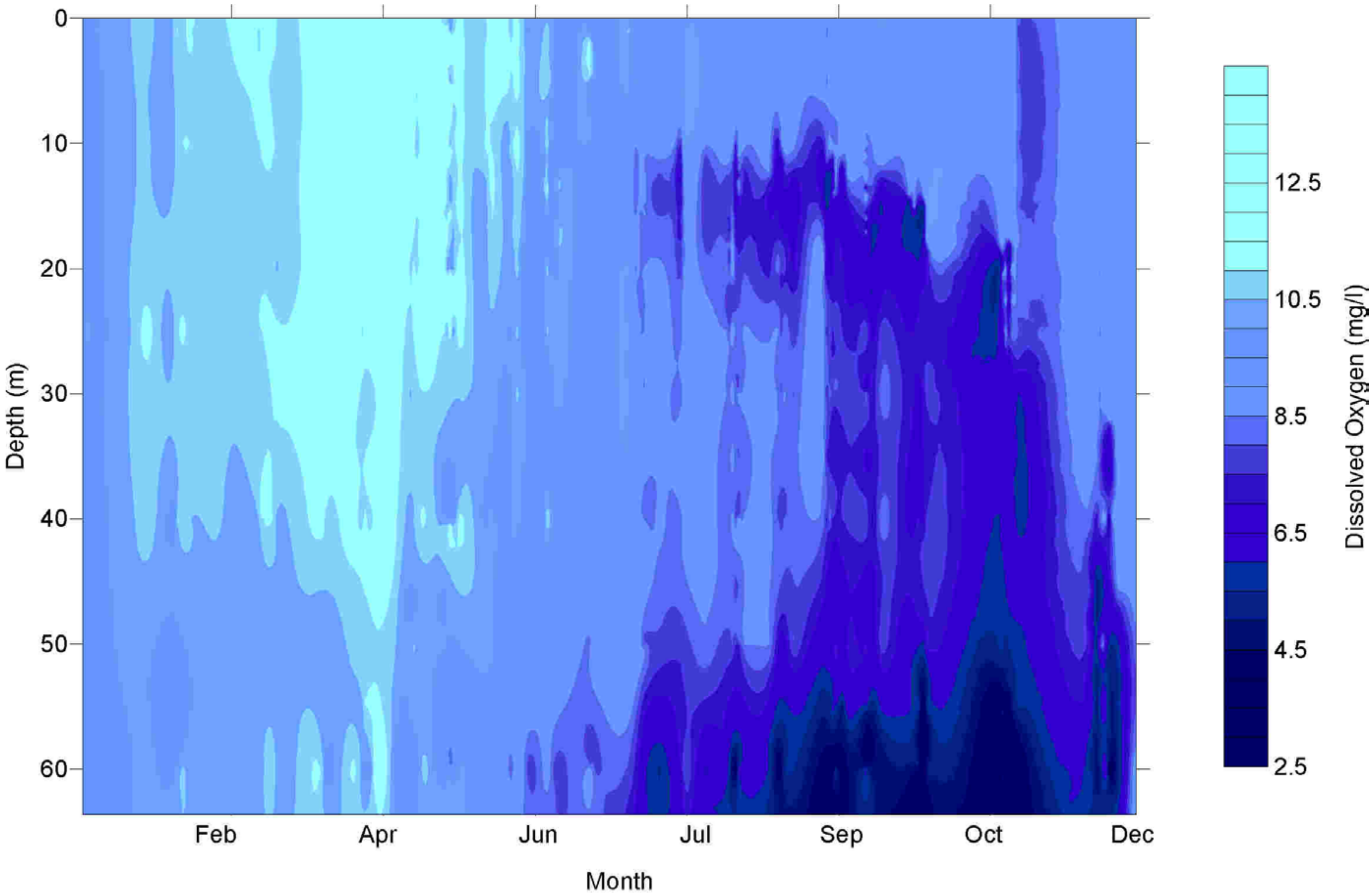

Figure 13. Dissolved Oxygen Profile at the Deep Water Station (0852) in Lake Washington for all Data From 1993 to 2001

4.2.2. Conductivity

Lake Washington conductivity was measured during the study period from 1992 through 2001. There was no pattern in the conductivity data by station, depth, or time. The conductivity ranged from a low of 60 to a high of 173 μmhos/cm, averaged between 80 and 108 μmhos/cm, and was around 90 μmhos/ml throughout the year and at all depths. This range is typical of soft water, lowland Puget Sound lakes and compares with conductivity observed during a nearshore study of Lake Washington conducted in 1981 through 1984 (METRO, 1985).

4.2.3. Alkalinity

During the study period between 1990 and 2001, the mean alkalinity for each station ranged from 34 to 40 mg/L. Annual alkalinity means are presented for the deep water station (0852) in Figure 14. The alkalinity at this station was similar to that observed throughout the lake (see Appendix A for station means and standard deviation). The annual variability probably reflects the inflow alkalinity, which is a measure of bicarbonate leaching from the watershed and can vary depending upon the intensity and timing of precipitation. Alkalinity in Lake Washington has increased over the past few decades, possibly in response to increased soil disturbance within the watershed (Edmondson, 1994).

4.2.4. pH

The pH of Lake Washington ranged from a low of 6.4 to a high of 9.2 between 1992 and 2001. The pH profile for the deep lake station (0852) for data collected between 1994 and 2001 is presented in Figure 15 (note: only partial monitoring at this station was conducted until 1994 and only complete data years were included in Figure 15). The pH profile illustrates several basic characteristics about the lake. The pH was only observed to be less than 7.0 in the top 10 m during late fall and early winter when the lake is completely mixed and photosynthetic activity is limited by light. In addition, the low pH throughout the water column is in part due to the mixing of low pH hypolimnetic water with the epilimnetic water at overturn. The pH in the hypolimnion tends to decrease to the mid to high 6 range as the stratified period progresses from spring to late summer due to respiration and the degradation of organic materials.

The pH profile in Figure 15 illustrates that pH is more dynamic than temperature (see Figure 4) during periods of mixing, because unlike temperature, the pH varies vertically in late winter through spring. The increase in pH from 6.4 to 6.8 observed in winter to a pH approaching neutrality (7.0) is due to mixing (allowing carbon dioxide to escape to the atmosphere) and the influence of alkalinity (buffering the pH). In the spring (April through June), as thermal stratification is established, pH in the surface waters reaches maximum levels in response to maximum photosynthetic production. The pH remains relatively elevated in the epilimnion through the summer period, coinciding with photosynthesis.

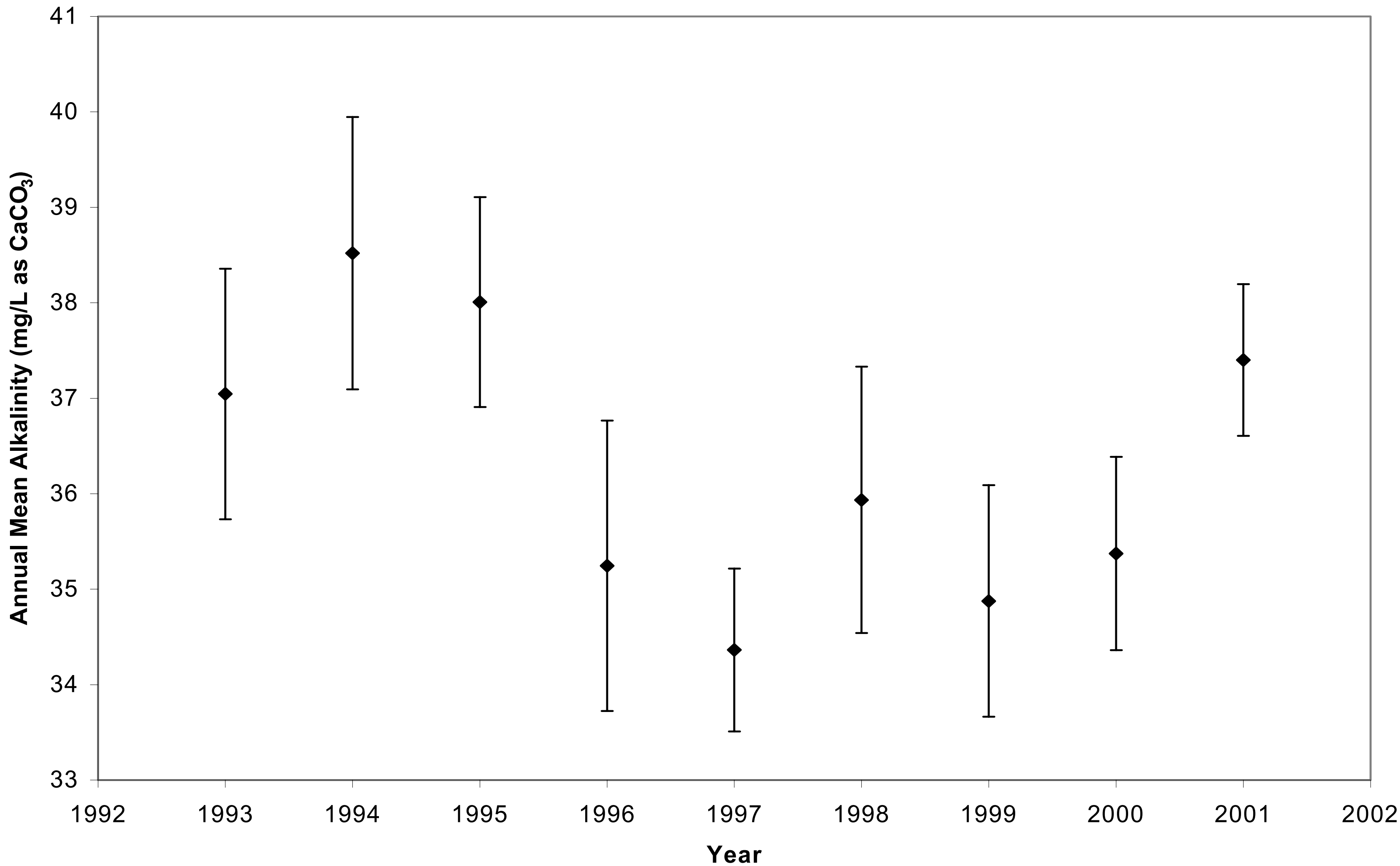

Figure 14. Annual Mean Water Column Alkalinity ($CaCO_3$ mg/L) for Station 0852 in Lake Washington for 1993 to 2001

Note: Means +/- SD are arithmetic.

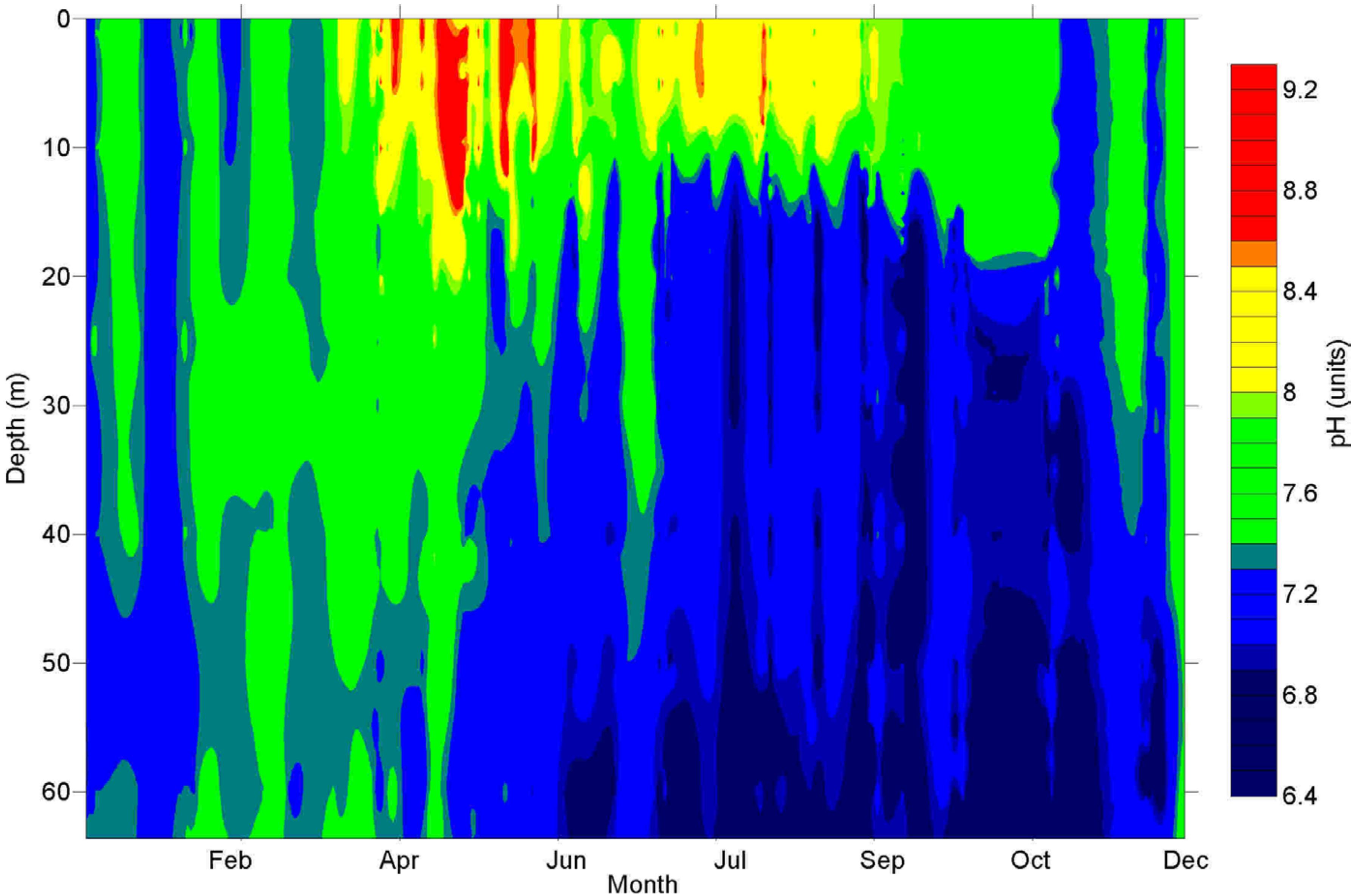

Figure 15. pH Profile for the Deep Lake Washington Station (0852) for Data Collected From 1994 to 2001

It is interesting to note that pH was not elevated directly above, at, or below the thermocline. An elevated pH around the thermocline would indicate that there was a layer of algae photosynthesizing at a greater rate than the algae in other depths of the euphotic (photosynthetic) zone or that algae were more abundant at this layer. The fact that this is not occurring in the lake confirms two things: (1) the lake is mixing vertically within the epilimnion, and (2) there is not an increase in photosynthesis at or near the thermocline, as seen in many large oligotrophic lakes (Hutchinson, 1957).

The pH in the nearshore waters was similar to that near the surface (0 to 9 m depth) in the pelagic region, indicating no difference in the horizontal distribution of pH (ANOVA; $p < 0.05$, $n = 10$, annual means).

4.2.5. Phosphorus

The annual, volume-weighted, whole-lake mean TP concentration is often used as a long-term indicator of a lake's enrichment status. Whole-lake mean TP represents the TP in the lake that is often predicted with mass-balance models and integrates the effects of unequal distribution of inflow due to effects of wind, stratification, surface inflow, and contributions from bottom sediment.

The annual whole-lake (log-transformed) mean TP concentration ranged from 10 to 18 µg/L from 1992 to 2001. Data were insufficient during 1990 and 1991 to calculate volume-weighted whole-lake means. Annual mean concentrations for 1998 through 2001 (10 to 12 µg/L) were substantially lower than the means observed in the previous 6 years (14 to 18 µg/L) (Figure 16). The difference between whole-lake mean TP from 1998 through 2001 and earlier years (1993 through 1997) was statistically significant (ANOVA; $p < 0.05$, $n = 12$, monthly means). However, closer examination showed that the difference was only between 2000 and 2001 means and the 1994 mean. Data for 1992 were omitted from statistical analysis because only one pelagic station was sampled.

Trend analysis of the annual TP means (arithmetic) using Kendall rank correlation indicate that there is a statistically significant trend toward decreasing TP concentration from 1993 to 2001 for whole-lake and pelagic area ($p < 0.05$), but not for nearshore area. No trend was identified when testing annual mean TP for 1993 through 1997 or 1998 through 2001. This reinforces the observation from the data presented in Figure 16 that there are two separate groups of means, 1990 through 1997 and 1998 through 2001.

Comparison with historical data (see Figure 3) shows that the range in annual whole-lake TP concentration has remained rather stable, not withstanding the recent downward trend. Although there has been a slight decline in whole-lake TP concentration over the last 10 years, TP is near the quickly established equilibrium for 1976 through 1979, following wastewater diversion. The January whole-lake concentration (index used by Edmondson and Lehman, 1981) averaged 15 µg/L from 1992 to 2001, well within the range for the annual means and only slightly less than the 4-year mean of 17 µg/L (1976 through 1979) reported by Edmondson and Lehman. The winter (January through March) whole-lake means for 1992 through 2001 averaged 16 µg/L, similar to that in January.

Nearshore volume-weighted mean TP concentrations were significantly greater than the pelagic means, in spite of high variability (ANOVA; $p < 0.05$, $n = 9$, annual means). While the annual volume-weighted mean TP in the nearshore areas was greater than in the whole-lake and pelagic areas, the year-to-year pattern was similar to that observed for the whole-lake means (Figure 16). The lower whole-lake concentrations indicate that the open water (pelagic) portion of lake dominated the effect of the higher nearshore concentrations. That would be expected given the relative volume of the two areas.

The pattern of lower whole-lake and nearshore means observed from 1998 to 2001, compared to previous years, was consistent for each season (Figures 17 and 18). That is, volume-weighted mean concentrations were usually lower in 1998 through 2001 in each season whether they were from the lake as a whole or nearshore only. Whole-lake winter means were generally less variable than for other seasons (Figure 17). The lower variability of winter concentrations makes them a good indicator of year-to-year trends. The completely mixed condition of the lake and higher water exchange in winter tends to evenly distribute constituents, accounting for much of the lower variability. In contrast to the whole-lake mean TP concentrations, nearshore means usually showed greater variability and were higher during winter than in other seasons (Figure 18). The minimal effect of the higher, more variable nearshore concentrations on the lower, more stable winter whole-lake concentrations was also due to the high flushing and complete mixing.

An assessment of causes for lower TP concentrations from 1998 to 2001 is beyond the scope of this report. However, there are two factors responsible for such annual variation in other large lakes that might apply here: (1) reduced external loading, and (2) longer water residence time. Reduced external loading would simply mean less TP income to replace the losses through sedimentation and outflow, while increased residence time would increase the loss to bottom sediments. These explanations would require that inflows were less during those 4 years than previously. While flows have not been examined directly, precipitation was not consistently low during those years. Another explanation could be reduced external loading due to improved stormwater treatment. Even if there were a trend of improved treatment, a step-change to account for the 4-year, lower concentrations is highly unlikely.

Examination of the annual volume-weighted mean TP concentrations in the hypolimnion and epilimnion (Figure 19) shows that the lower whole-lake TP in recent years is due in part to the marked decline in hypolimnetic TP. There is a significant trend toward reduced hypolimnetic TP concentrations over the last 10 years from an annual mean of 33 µg/L in 1992 to 13 µg/L in 2001. Trend analysis using Kendall rank correlation showed a statistically significant ($p < 0.05$, $n = 9$, annual arithmetic means) decrease in hypolimnetic TP concentration from 1993 through 2001. No trend was indicated for epilimnetic TP over the same period. This trend toward reduced TP concentration may in part account for the similar trend observed for whole-lake TP means discussed earlier. For this analysis, the hypolimnion was defined as all water from 25 m to 60 m and the epilimnion layer between the surface and a depth of 20 m for the whole year. This trend is similarly apparent for volume-weighted TP concentrations in the hypolimnion during the spring-fall stratified periods only.

The TP concentrations in Lake Washington are in large part a reflection of the P loading from the Cedar River, which has good water quality and relatively low P concentration. From 1995 to 2000, the Cedar River contribution averaged 50% of the total annual flow into Lake Washington, and that source contained an annual volume-weighted mean TP concentration of 17.2 µg/L, while the other 50% of inflow from the Sammamish River, other tributaries, and nearshore non-point sources had a combined mean of 56 µg/L (Table 1, Arhonditis et al. unpublished manuscript). Hence, the Cedar River is essentially diluting other TP sources to the lake. The expected lake TP concentration resulting from the Cedar River load (25% of the total) is only about 7 µg/L [TP inflow (1 – R)], using the TP retention coefficient (R) from Edmondson and Lehman (1981). Thus, if Lake Washington received only Cedar River water, its concentration would be about half the 1993 through 2001 whole-lake average (15 µg/L). There is little internal loading of P during summer from bottom sediments in Lake Washington, so there is little hypolimnetic entrainment of bioavailable P in the surface waters during the growing season. Respective inflow TP loads and expected lake concentrations from the remaining inputs averaged 71 and 28 µg/L. Without the high-quality Cedar River inflow, the quality of Lake Washington would be many times poorer, given that 63% of the lake's immediate watershed is urbanized.

The importance of the low Cedar River TP concentration relates directly to the size of the spring algal bloom. That is, soluble P, which is strongly influenced by the Cedar River input as indicated, remains relatively high during winter when mixing and low incident light combine to prevent algal utilization and growth. When incident light increases and warms the surface water, temporary thermal stability of the water column occurs. The temporary stability reduces the mixing depth of the algae, allowing the algae to produce more biomass than is respired, utilize the available P, and develop a bloom. While this explains the timing and magnitude of spring algal blooms in deep lakes generally (Welch, 1992), diurnal variations in solar heating and wind mixing may cause year-to-year variations in bloom magnitude. Nevertheless, the large historical magnitude of algal blooms in Lake Washington, beginning in spring and continuing into summer, was caused by the change in winter soluble P concentration determined by external loading (Edmondson, 1969; Edmondson and Litt, 1982).

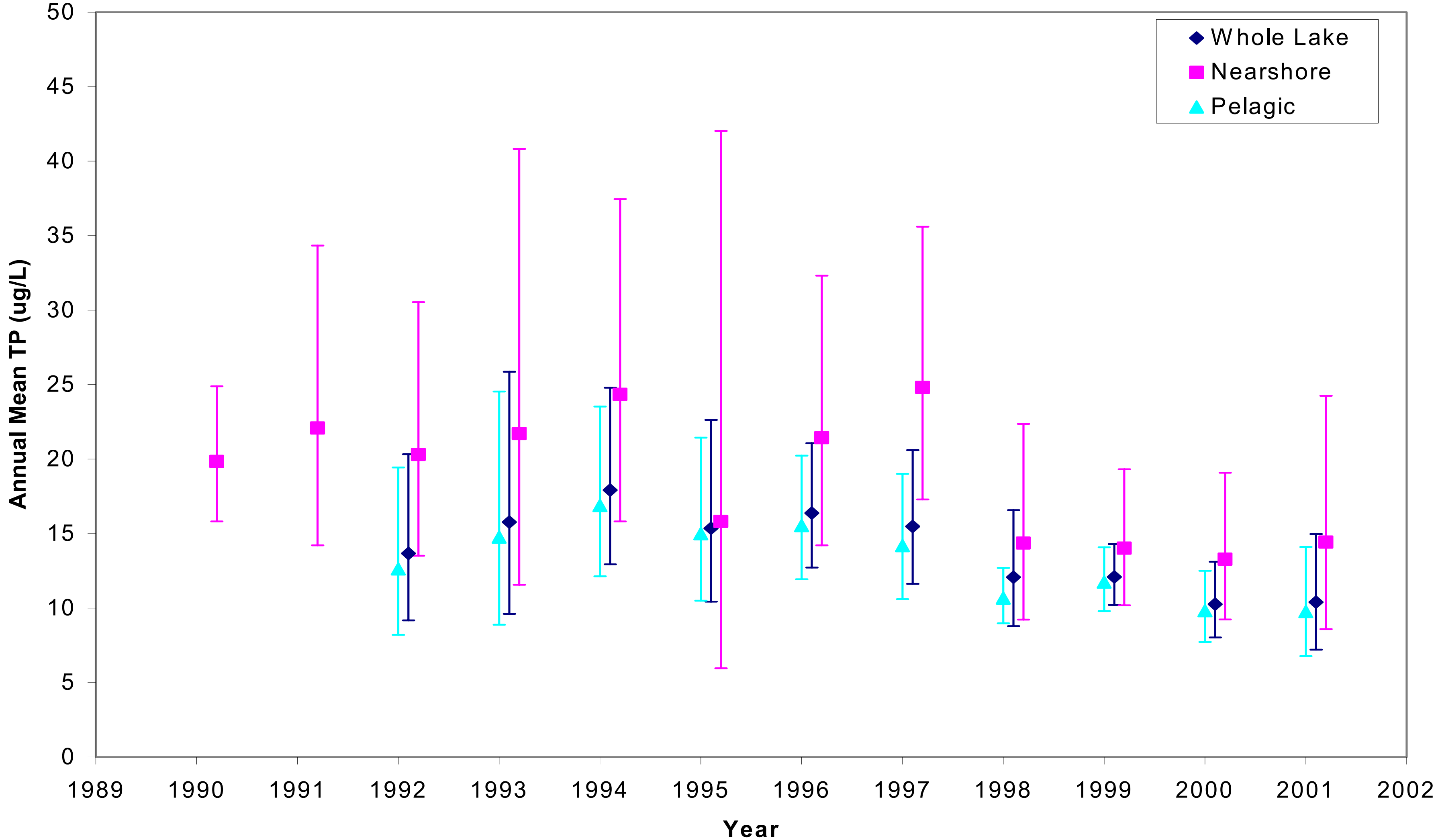

Figure 16. Annual Volume-Weighted Whole-Lake (1992 to 2001), Pelagic (1992 to 2001), and Nearshore (1990 to 2001) Mean Total Phosphorus Concentrations in Lake Washington

Note: Means +/- SD are based on log-transformed data.

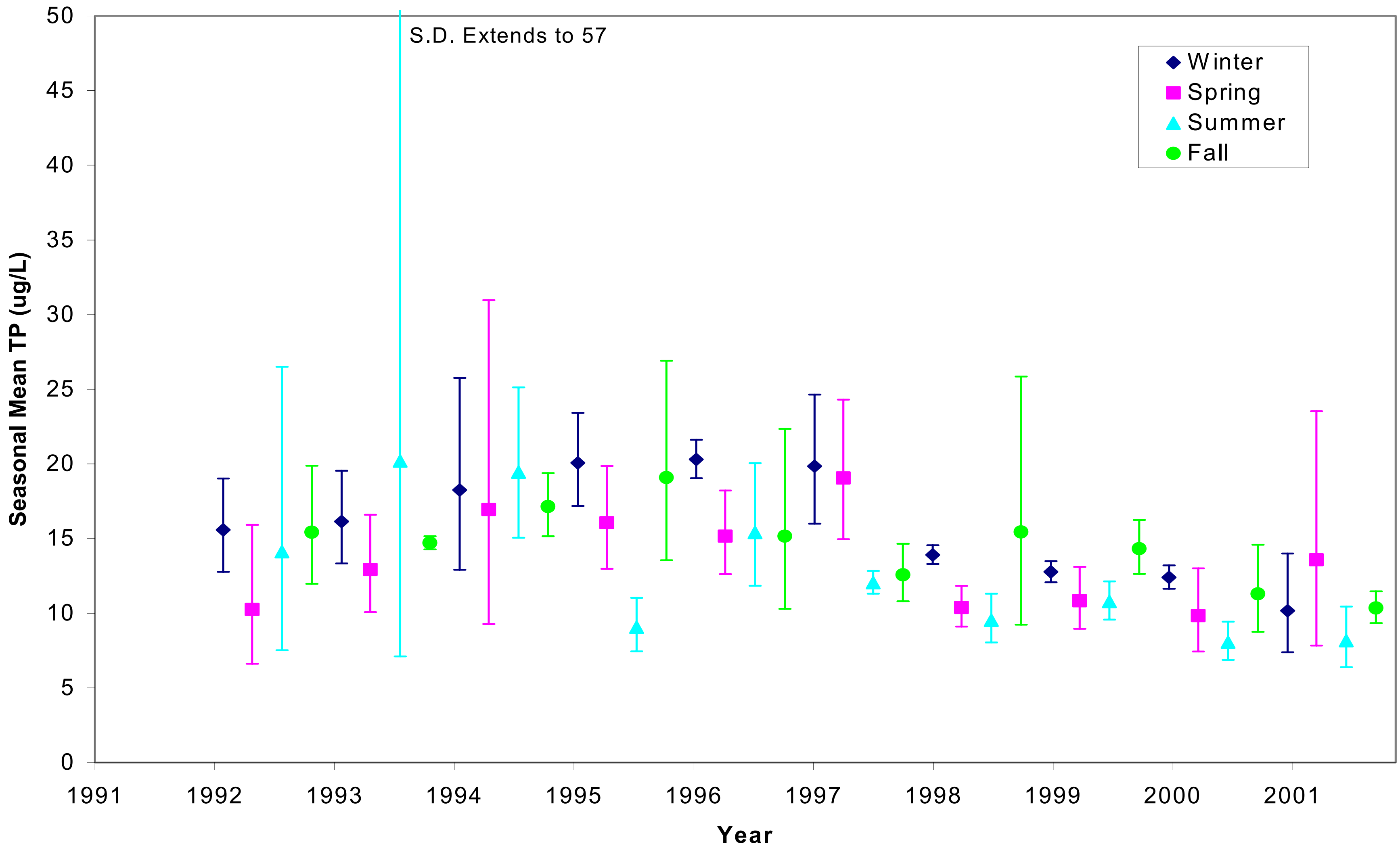

Figure 17. Seasonal Volume-Weighted Whole-Lake Mean Total Phosphorus Concentrations in Lake Washington From 1992 to 2001

.Note: Means +/- SD are based on log-transformed data.

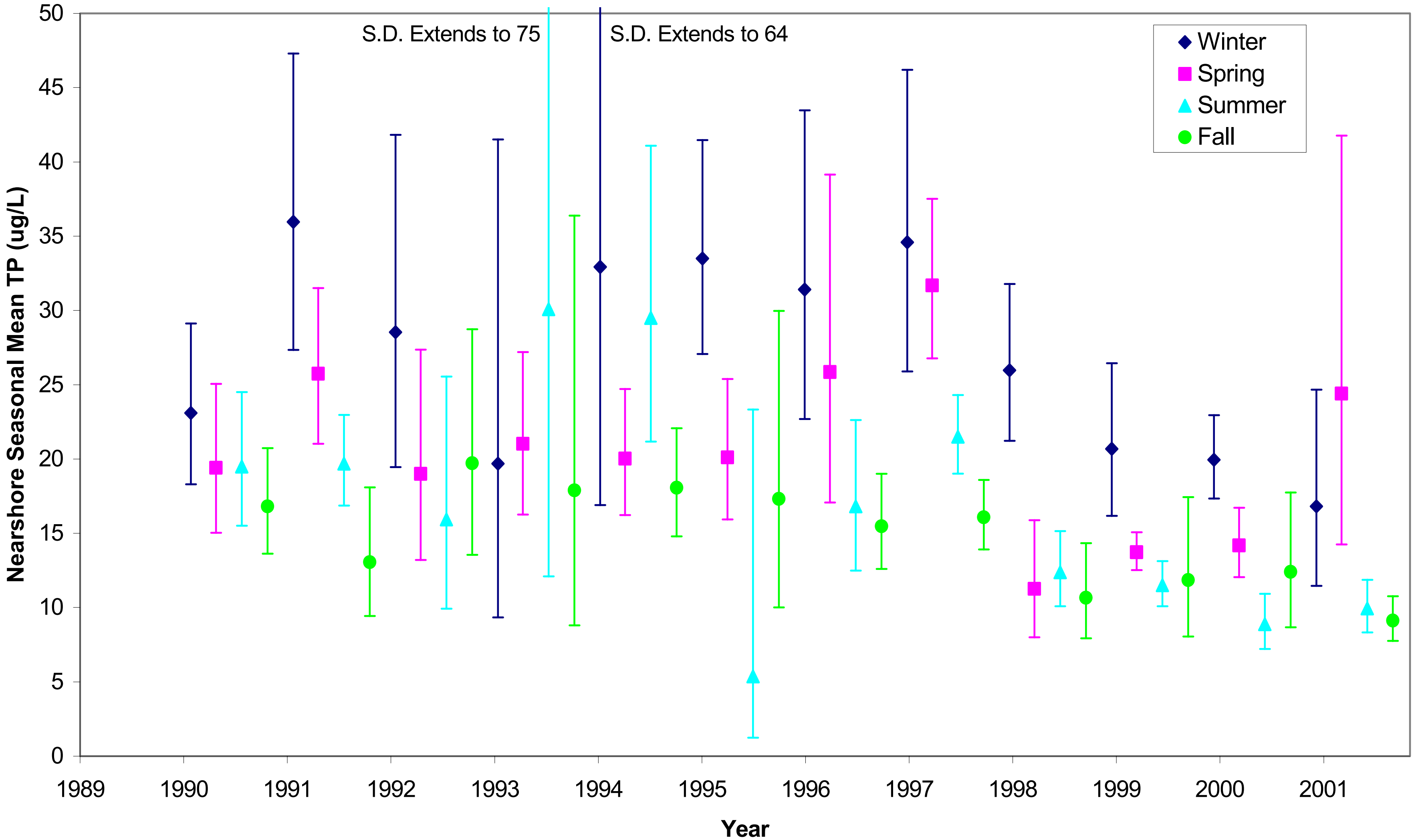

Figure 18. Seasonal Volume-Weighted Nearshore Mean Total Phosphorus Concentrations in Lake Washington From 1990 to 2001

.Note: Means +/- SD are based on log-transformed data.

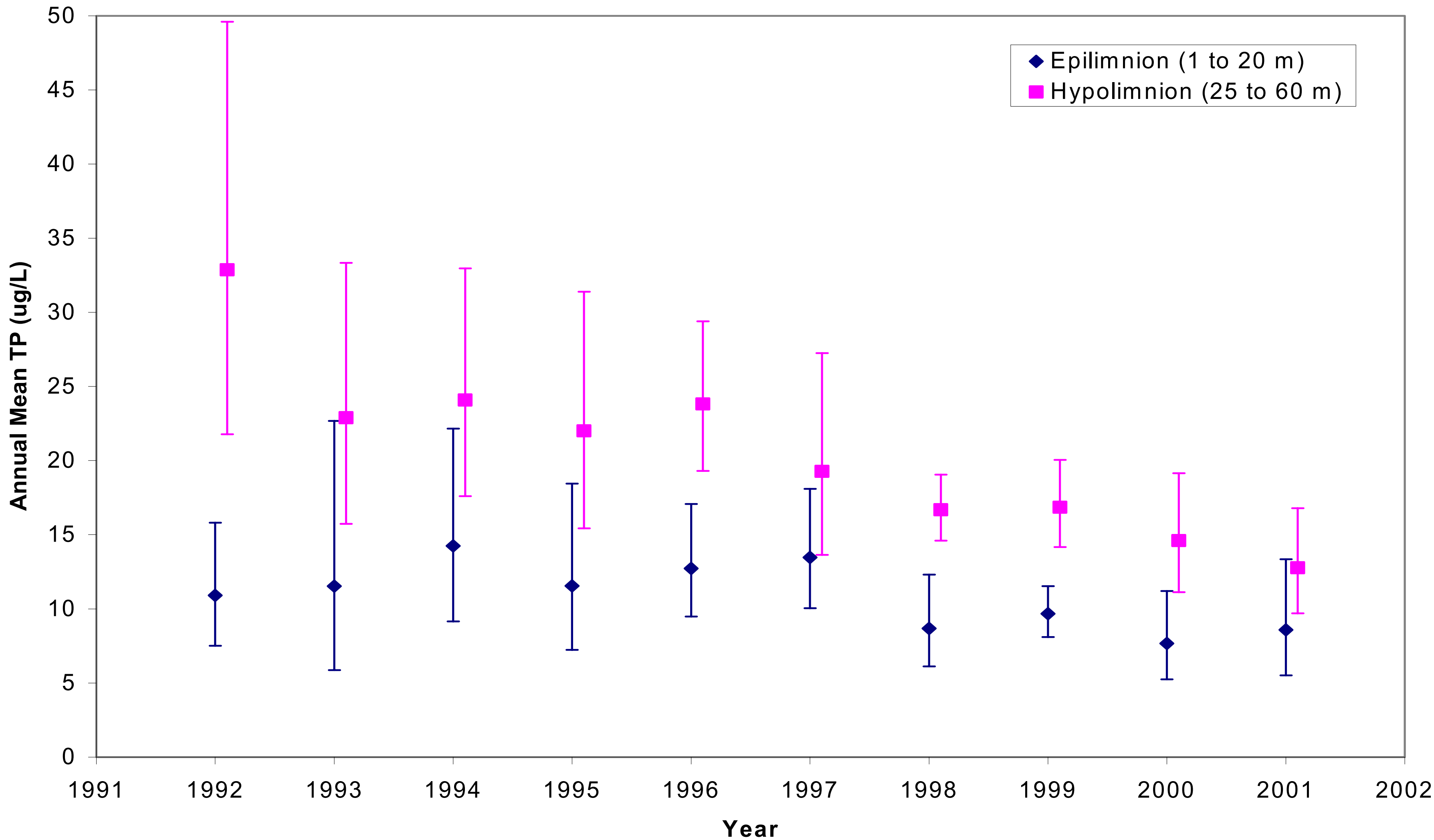

Figure 19. Volume-Weighted Annual Mean Total Phosphorus Concentrations in Lake Washington From 1992 to 2001 in the Epilimnetic and Hypolimnetic Layers

.Note: Means +/- SD are based on log-transformed data.

4.2.6. Soluble Reactive Phosphorus

Mean annual volume-weighted soluble reactive phosphorus (SRP) concentrations ranged from 2 to 11µg/L in the nearshore areas and 3 to 8 µg/L in both the pelagic area and the whole lake (Figure 20). SRP concentrations in the nearshore were lower from 1998 to 2001 than the previous 8 years, especially in 2001 (Figure 20). Pelagic and whole-lake mean SRP concentrations were lower only for the last 2 years. ANOVA analysis of monthly mean concentrations from 1993 through 2001 showed that SRP concentrations in the nearshore, pelagic, and whole-lake areas from 2001 were significantly different from those from 1993 through 1997 ($p < 0.05$, $n = 12$, monthly means). Data from 1990 through 1992 were omitted due to limited sampling.

As would be expected in P-limited systems (see Section 4.2.7), the mean SRP concentrations were usually higher during winter than spring and summer due to greater loading and reduced algal uptake (Figure 21). Spring SRP concentrations were usually lowest due to the maximum utilization by algae, as indicated above. The generally low summer concentrations are a reflection of low external loading, due to low summer inflow and settling of particulate P with sinking algae. Fall concentrations were typically higher than those in spring and summer, reflecting the increase in external loading, entrainment from higher hypolimnion concentrations, and also limited plankton algal uptake due to increasing growth restrictions as light and temperature decreased. In general, the SRP concentrations in the lake were largely less than 10 µg/L, the level below which biomass increase is strongly dependent on P (Sas, 1989).

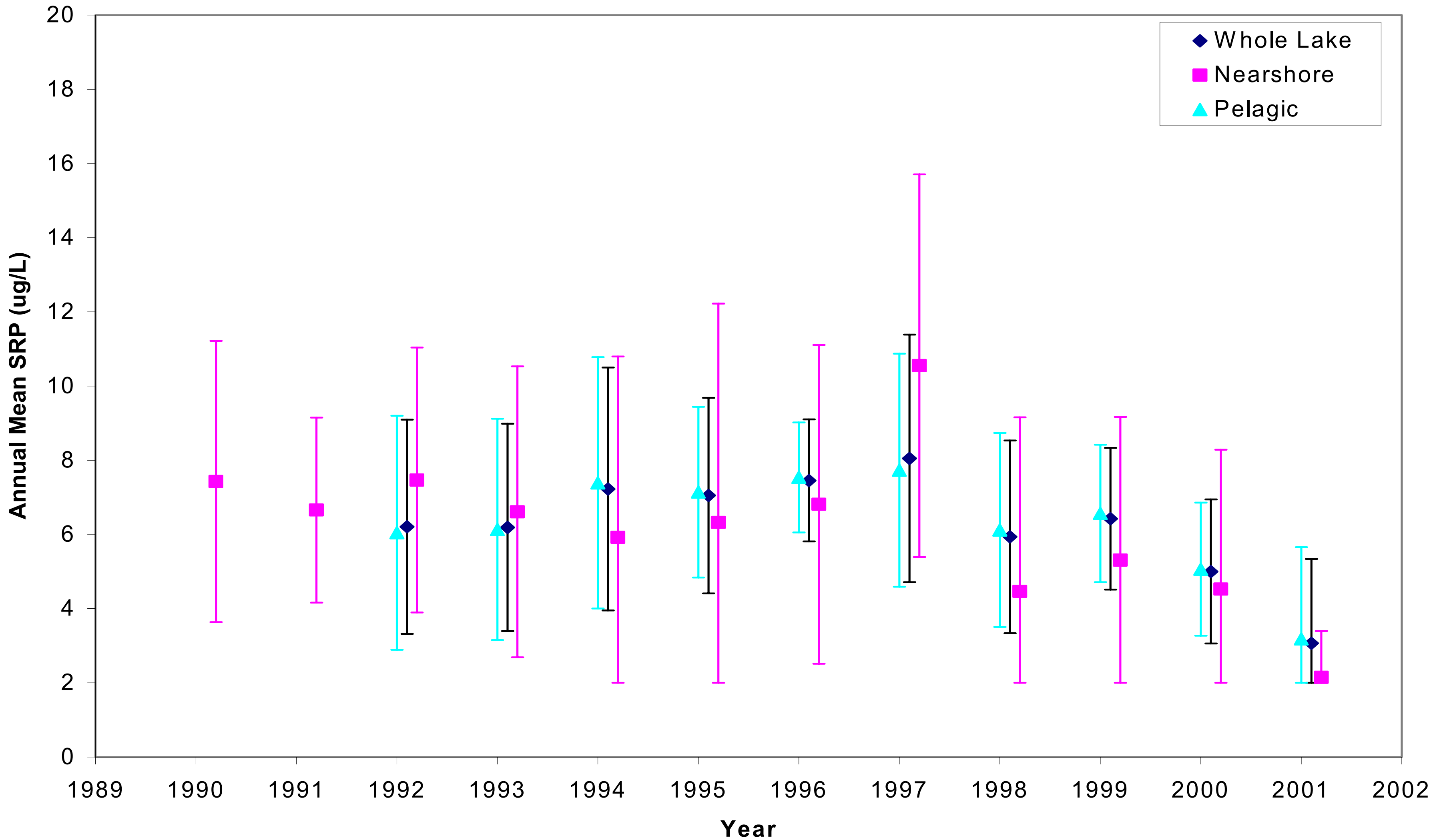

Figure 20. Annual Volume-Weighted Nearshore (1990 to 2001), Pelagic (1992 to 2001), and Whole-Lake (1992 to 2001) Mean SRP Concentrations

Note: Means +/- SD are arithmetic.

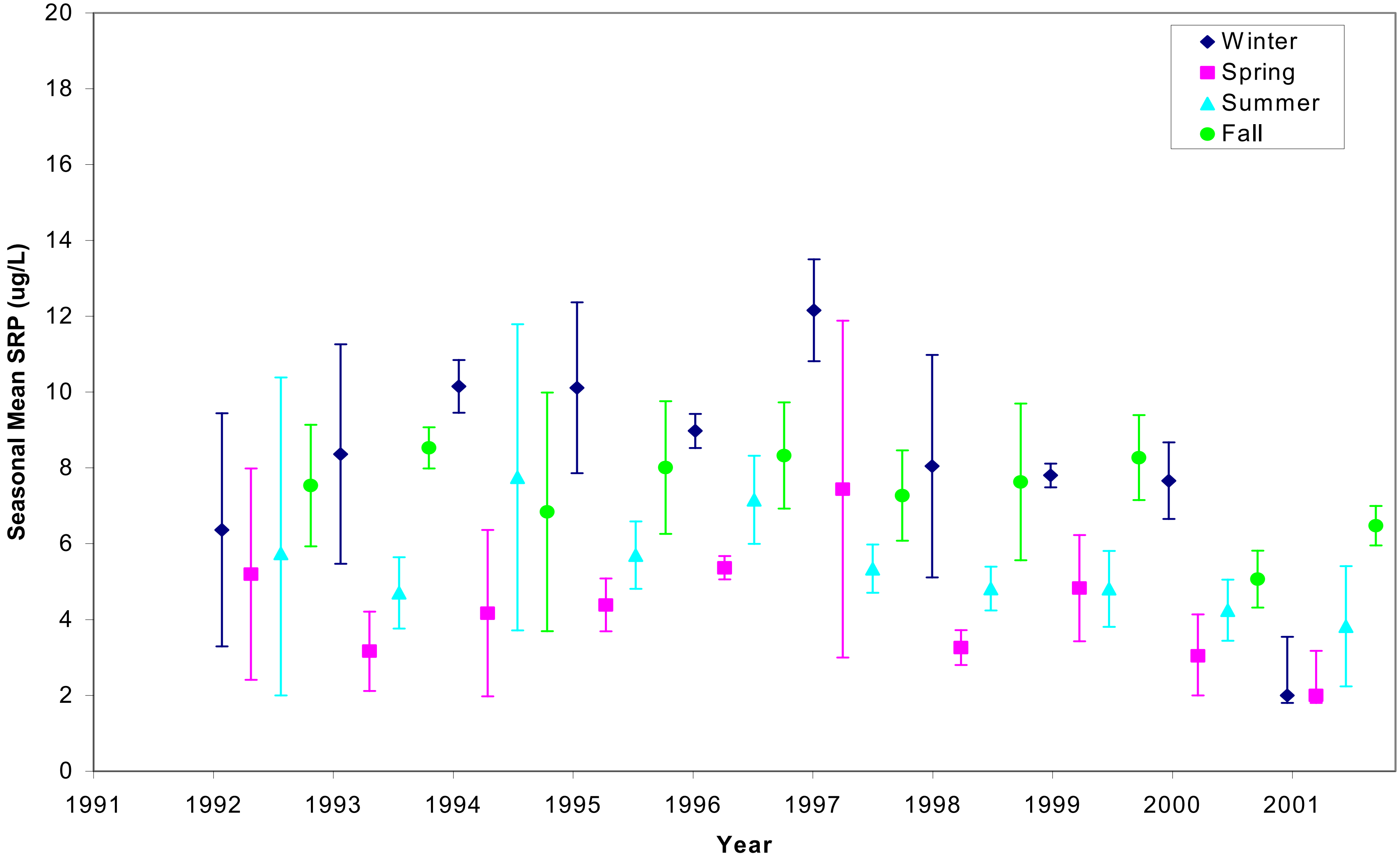

Figure 21. Seasonal Volume-Weighted Whole-Lake Mean SRP Concentrations in Lake Washington From 1992 to 2001

Note: Means +/- SD are arithmetic.

4.2.7. Nitrogen

The epilimnetic and hypolimnetic annual mean volume-weighted TN concentrations in Lake Washington followed a similar year-to-year pattern from 1993 through 2001(Figure 22). The epilimnion contained significantly less nitrogen than did the hypolimnion (ANOVA; $p < 0.05$, $n = 9$, annual averages), which is to be expected due to the settling out of particulate matter during stratified periods and algal uptake.. The hypolimnetic annual mean volume-weighted TN concentrations ranged from 320 to 440 µg/L, and the epilimnetic annual mean volume-weighted TN concentrations ranged from 100 to 275 µg/L. Although it would appear from Figure 22 that there was a trend toward increasing nitrogen concentration over time in both the epilimnion and hypolimnion, the relatively low annual mean TN concentration in 2001 counters any statistical significance. Analysis of monitoring data from future years will determine if there is a trend.

Annual mean TN at the nearshore areas was consistently higher than in pelagic areas, ranging from 275 to 390 µg/L and 160 to 330 µg/L, respectively. Whole-lake means were nearly the same as pelagic concentrations, as would be expected since the nearshore volume represents a small portion of the lake.

From 1993 to 1999, whole-lake spring TN concentrations were, in general, higher than for other seasons (Figure 24). In contrast, whole-lake nitrate-nitrogen concentrations were usually highest in the winter (Figure 25). This seasonal influence on nitrate-nitrogen was also noticeable in the nearshore areas (Figure 26). The high winter nitrate-nitrogen means were probably due to the influence of reduced uptake by wintering terrestial plants and increased storm water runoff . Although nitrate concentrations decreased in the summer, concentrations remained an order of magnitude higher than SRP.

The annual mean nitrate-nitrogen whole-lake concentration ranged from 122 to 212 µg/L, nearshore concentrations ranged from 99 to 196 µg/L, and pelagic concentrations ranged from 116 to 215 µg/L (Figure 27). Nitrate-nitrogen makes up a relatively large fraction of the lake TN, as can be seen by comparing Figure 23 with Figure 27. No long-term trend was found for nitrate-nitrogen, nor was there a difference between the nearshore and pelagic areas (ANOVA test, $p < 0.05$, $n = 9$, annual means). Note that the dataset for nitrate-nitrogen is more complete than the TN dataset; therefore, Figures 25 through 27 start in 1990 and 1992 instead of 1993.

As would be expected due to the oxic water column, the ammonium-nitrogen in the lake was relatively low and only made up a fraction of the TN in the lake. The whole-lake volume-weighted ammonium-nitrogen average was highly variable over this period, and no long-term significant trend was observed. The 1998 through 2001 annual means were lower than 1994 through 1997 annual means ($p < 0.05$, $n = 12$, monthly means) (Figure 28). Because of the variability in the data, a longer period of record is required to determine if there has, in fact, been a decreasing trend.

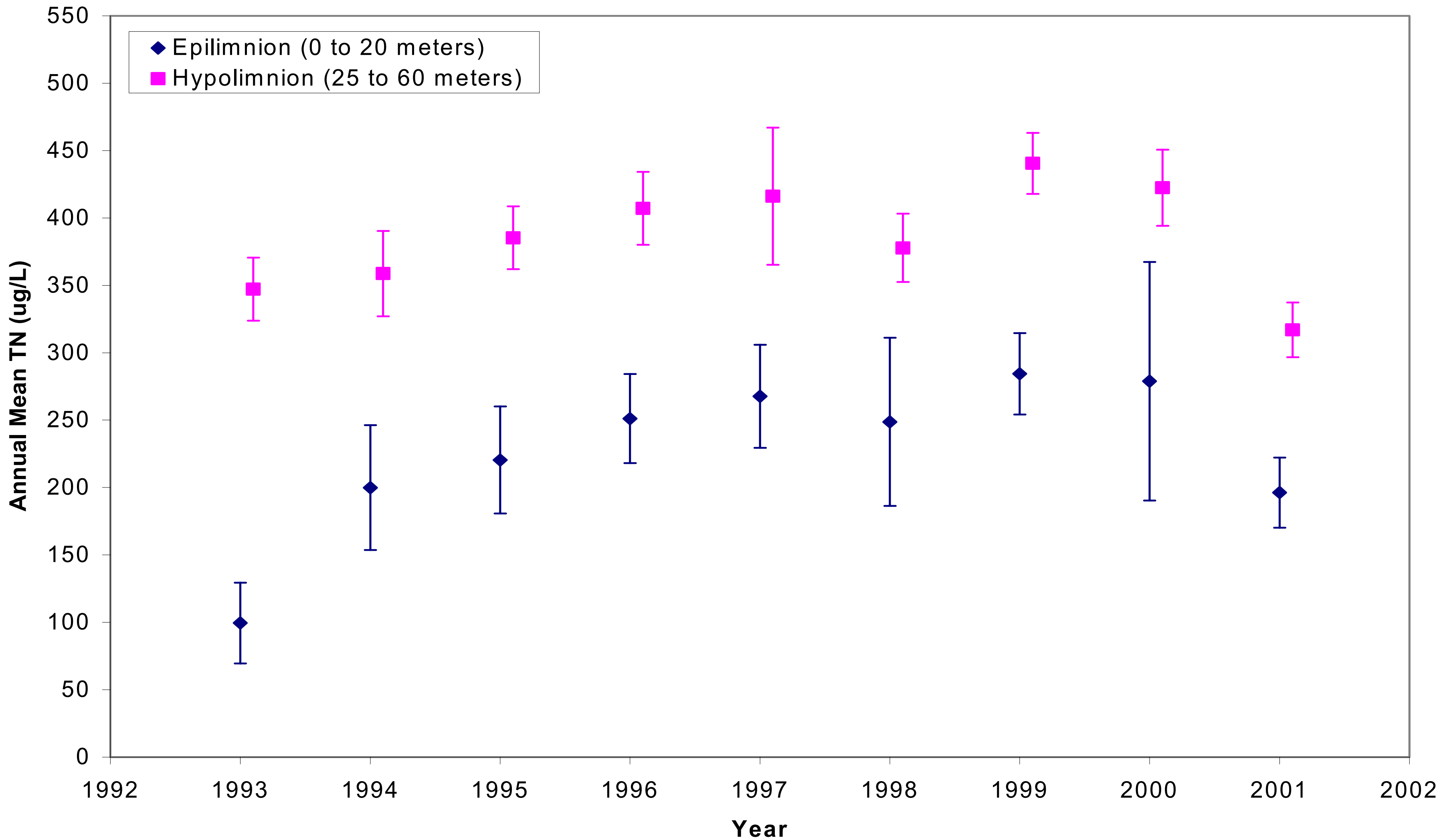

Figure 22. Annual Volume-Weighted Mean Total Nitrogen (TN) Concentration for the Epilimnion and Hypolimnion of Lake Washington

Note: Means +/- SD are arithmetic.

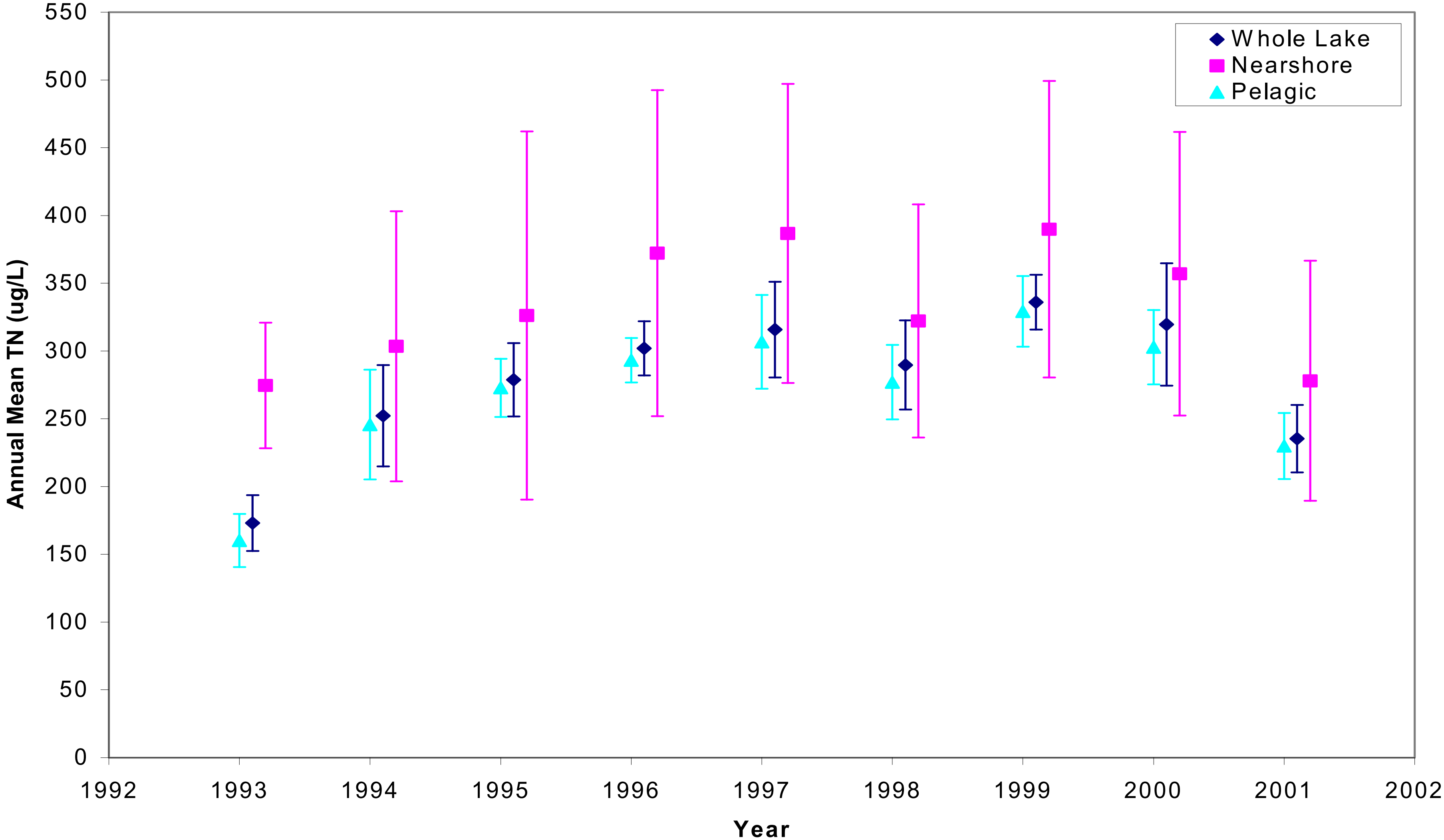

Figure 23. Annual Volume-Weighted Mean Whole-Lake, Nearshore, and Pelagic Total Nitrogen (TN) Concentration for Lake Washington, 1993 to 2001

Note: Means +/- SD are arithmetic.

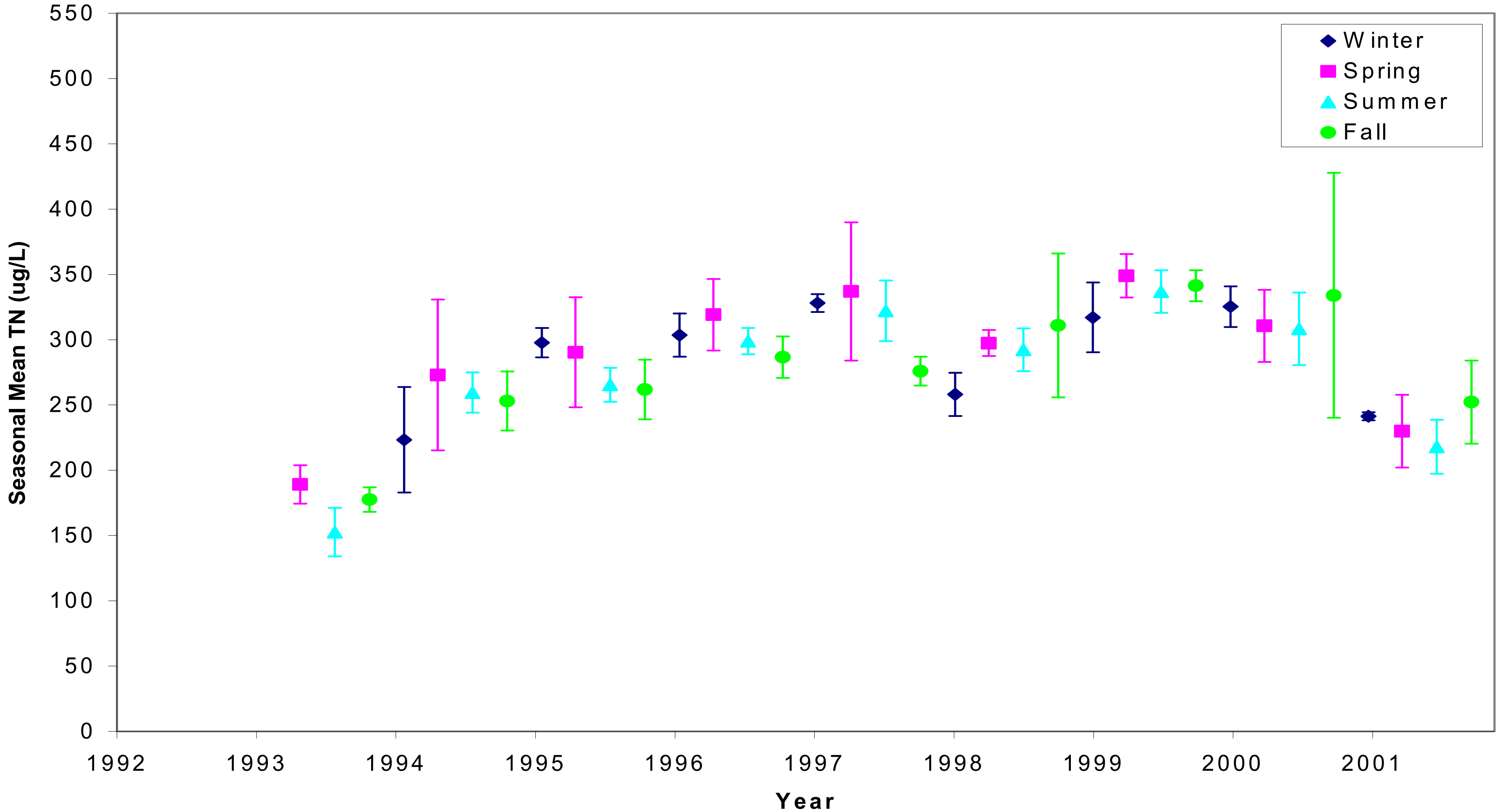

Figure 24. Seasonal Volume-Weighted Mean Whole-Lake Total Nitrogen (TN) Concentrations for Lake Washington, 1993 to 2001

Note: Means +/- SD are arithmetic.

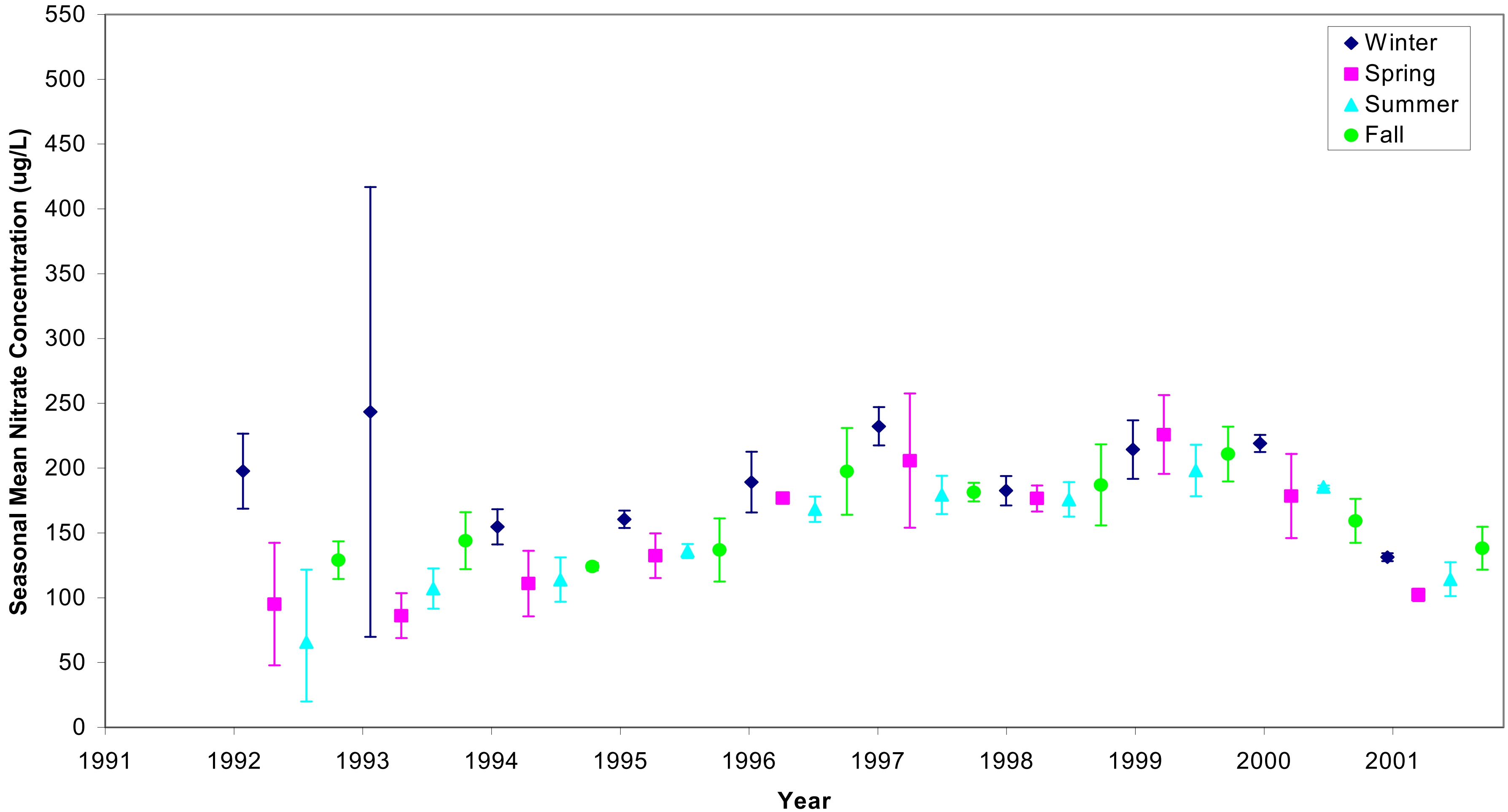

Figure 25. Seasonal Volume-Weighted Mean Whole-Lake Nitrate-Nitrogen for Lake Washington, 1992 to 2001

Note: Means +/- SD are arithmetic.

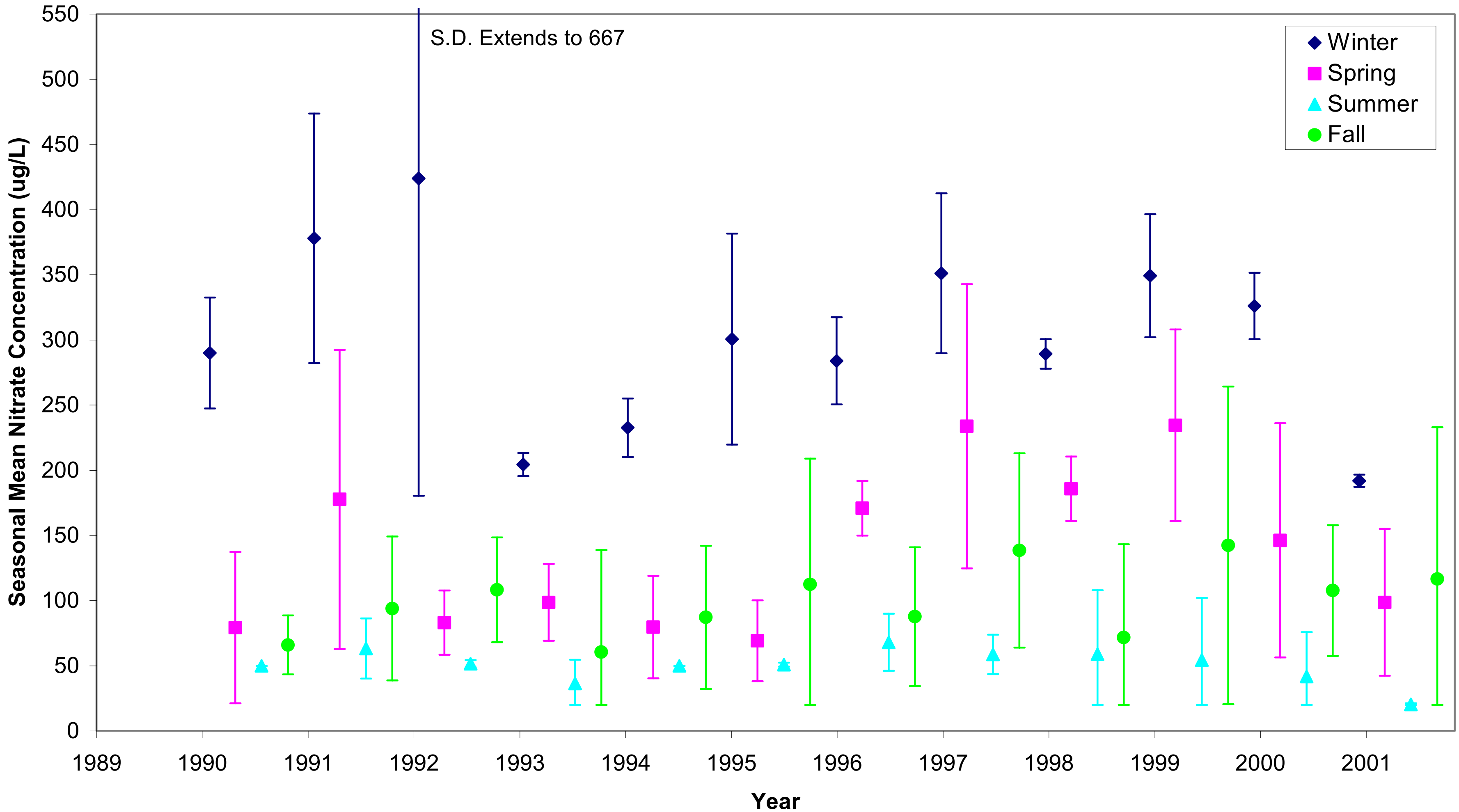

Figure 26. Seasonal Volume-Weighted Mean Nearshore Nitrate-Nitrogen Concentrations for Lake Washington, 1990 to 2001

Note: Means +/- SD are arithmetic.

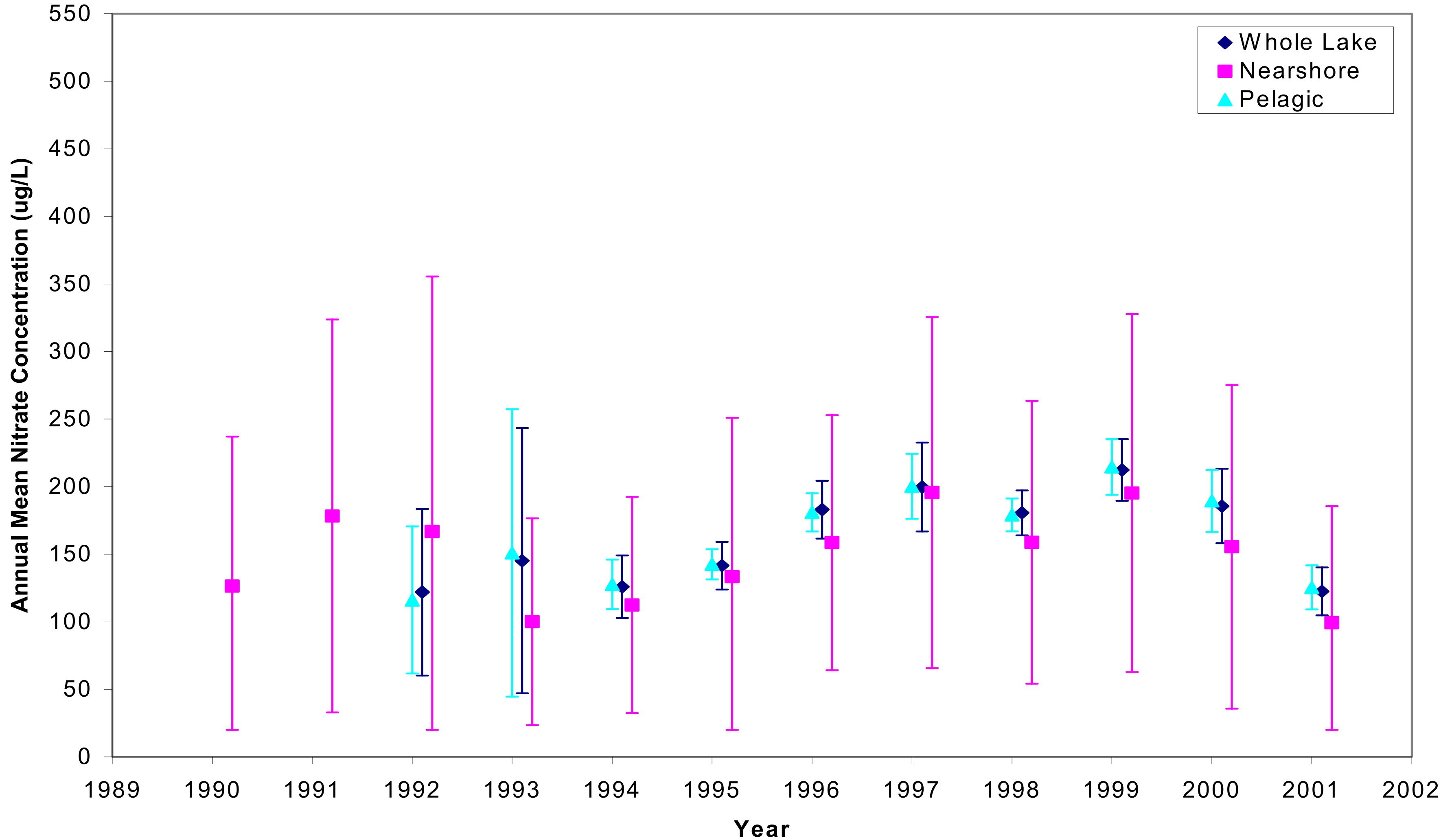

Figure 27. Annual Volume-Weighted Mean Whole-Lake, Nearshore, and Pelagic Nitrate-Nitrogen Concentrations for Lake Washington, 1990 to 2001

Note: Means +/- SD are arithmetic.

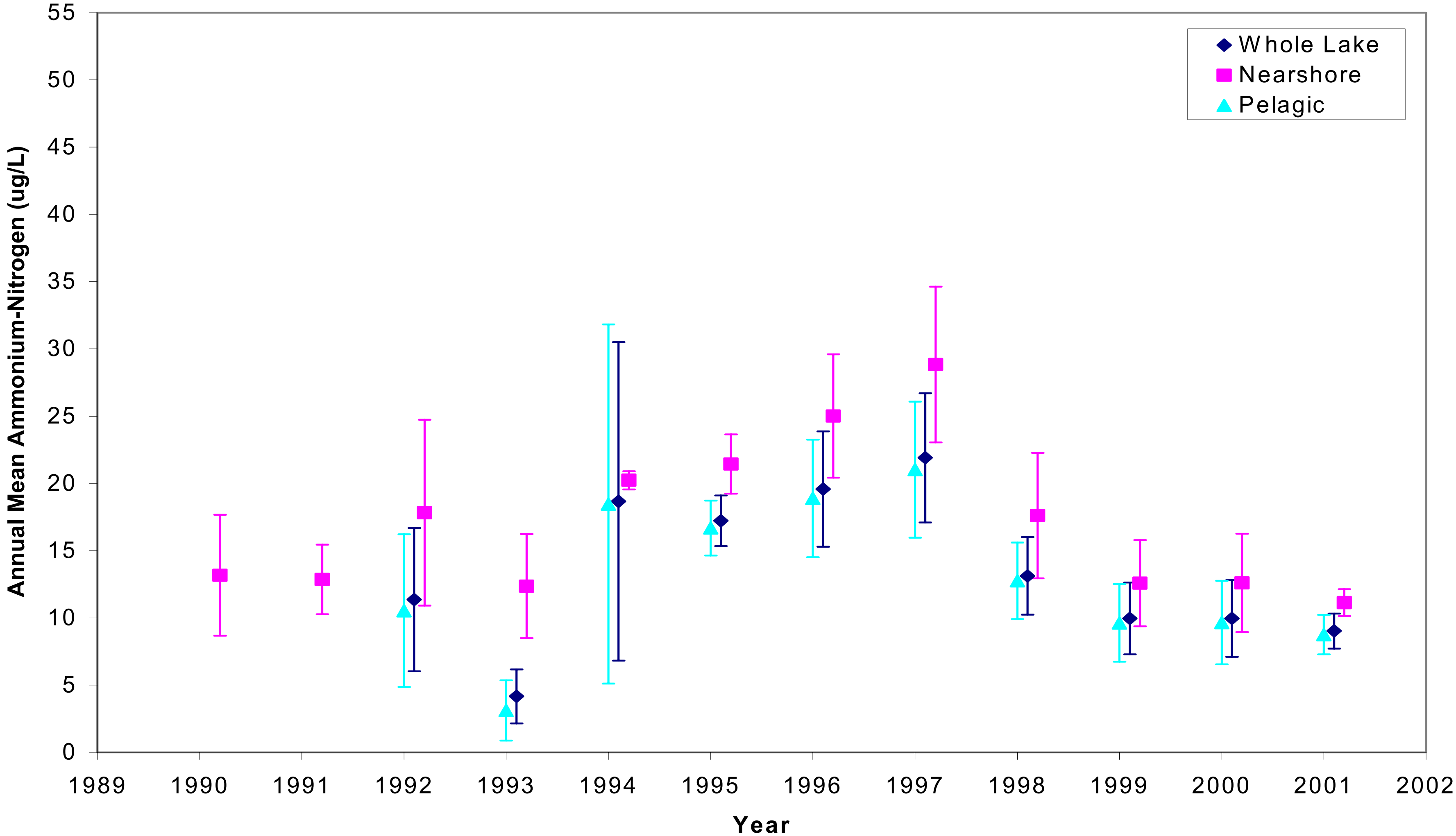

Figure 28. Annual Volume-Weighted Mean Whole-Lake, Nearshore, and Pelagic Ammonium Concentrations for Lake Washington, 1990 to 2001

Note: Means +/- SD are arithmetic. Scale is smaller than for Figures 18 through 23.

4.2.8. Nutrient Limitation

Algal growth, or more properly termed productivity, is limited by nutrients or environmental conditions (temperature, solar energy). In lakes, the primary productivity is usually limited or controlled by nutrient availability. Primary productivity in lowland Puget Sound area lakes, as for most lakes in the world, is typically limited by the macronutrient, phosphorus. Nitrogen can also limit algal growth at times. To estimate which nutrient is limiting the productivity, the TN:TP ratio can be used. Generally, if the molecular TN:TP ratio is greater than 16:1, then the algal productivity is considered limited by P availability (Carroll and Pelletier, 1991). Nutrient ratios are usually expressed on a weight (mass) basis, e.g., μg TN:μg TP. The Redfield TN:TP ratio of 16:1, calculated using the number of atoms, is approximately equivalent to 7:1 by weight.

The annual mean TN:TP ratios were similar for the epilimnion and the whole lake (Figure 29). There was a trend toward increasing TN:TP ratio in the lake from 1994 through 2001 that was statistically significant ($p < 0.05$, $n = 8$). (TN:TP ratios were not calculated prior to 1994 due to incomplete data records.) The TN:TP ratios exceeded the Redfield ratio of 7:1 (Figure 29), which is often considered the threshold for P limitation. This would indicate that the lake is becoming increasingly limited by P. The dramatic decrease in the TN:TP ratio that occurred in 2001 was due in part to a decrease in epilimnetic and whole-lake TN concentration observed in 2001. At the same time, the TP concentration in both the epilimnion and the whole lake increased in 2001 from 2000 concentrations. Nevertheless, the TN:TP ratio for 2001 was still well above the P-limit threshold.

The overall trend of increasing TN:TP ratio from 1994 through 2001 is directly related to the trends in annual TN and TP concentrations (see Figures 23 and 16). Although TN increased from 1994 through 2000, except for a reduction in 2001, the change in TP in the opposite direction was even greater, especially from 1998 to 2000 (see Sections 4.2.5 and 4.2.6 for TP and TN trend analysis). This then is the cause for the increase in TN:TP ratio over the same period. As discussed in previous sections, the TP concentration in the lake is a function of external loading, sedimentation, and flushing. Future investigations may help determine the causes for these trends when loading from land uses relative to storm water runoff and flows from major water supplies, i.e. Cedar River, are better defined.

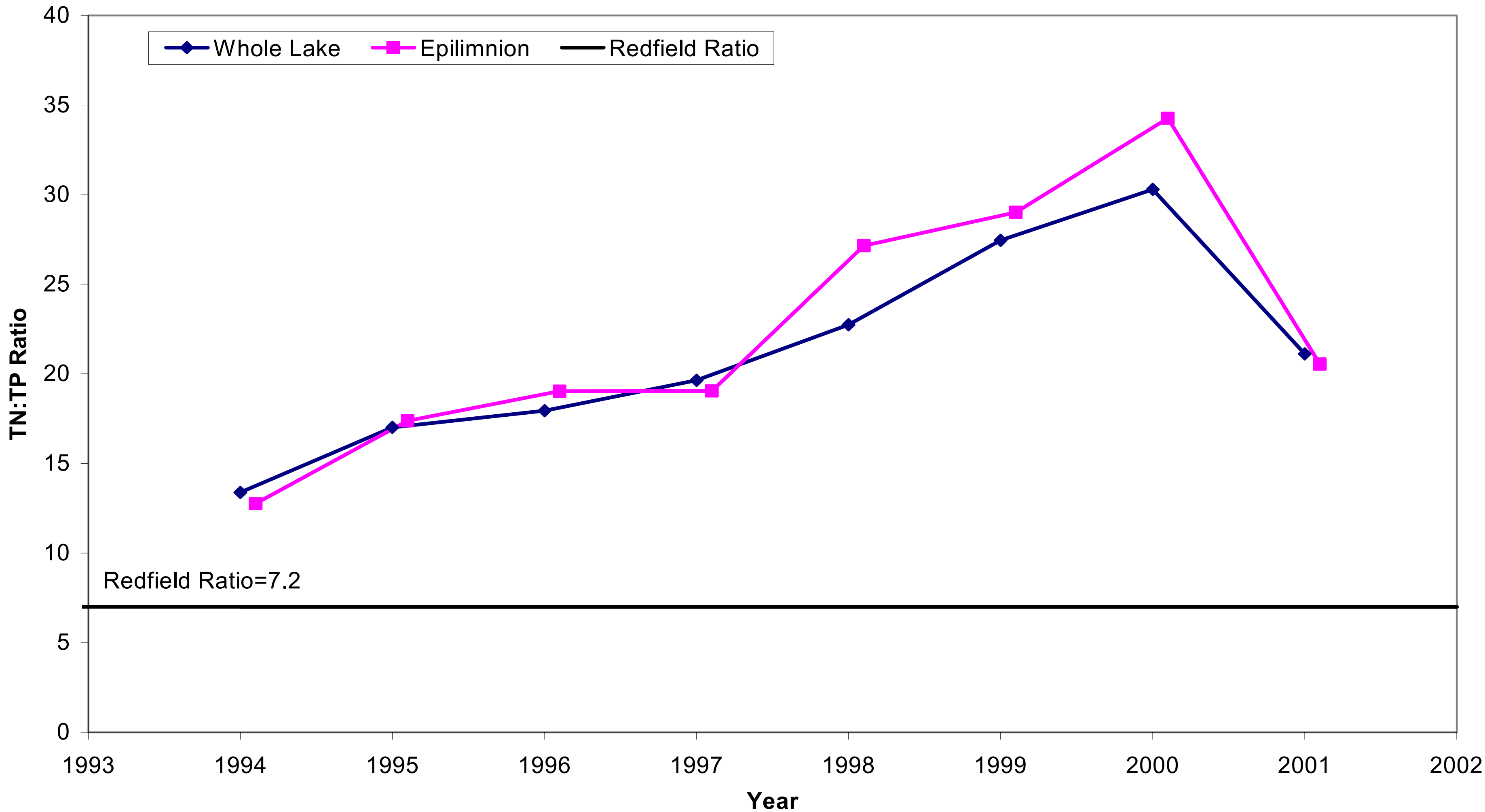

Figure 29. Annual Whole-Lake and Epilimnetic Ratios of Total Nitrogen (TN) to Total Phosphorus (TP) for Lake Washington From 1994 to 2001, Compared to the Redfield Ratio

Note: Ratios are based on molecular weights.

4.3. Biological Conditions

4.3.1. Chlorophyll *a* (chl *a*)

The photosynthetic pigment chl *a* represents a reliable estimate of algal biomass (total wet or dry weight) and is used universally as an index of biological response to nutrient enrichment. Mean growing season concentrations are commonly used to indicate trophic state and the acceptability of water quality for recreation and water supply use. While chl *a* is a good indicator of total algal biomass, biovolume estimates from microscopic examination of individual taxa are necessary to determine their relative contribution to total biomass.

From a historical perspective, chl *a* content declined sharply from 1969 to 1970, proportional to P decrease, following wastewater diversion (Edmondson, 1970). Chl *a* declined yet again after 1976 to a summer mean of 3 µg/L when zooplankton grazing increased (Edmondson and Litt, 1982). Summer mean chl *a* from 1990 through 2001 ranged from 0.5 to 3.6 µg/L with a 12-year mean of 2.4 µg/L (Figure 30).

The highest chl *a* concentrations in Lake Washington occurred during early to mid spring (Figures 30 and 31), when available light in the water column reached an intensity that allowed the growth of wind-mixed algal cells, mostly diatoms, to exceed losses. Temporary density stability in the water column, which results from increased surface warming, is important for maintaining algal cells in the lighted zone. Mixing during cooler nights distributes chl *a* to greater depths, as indicated by high DO concentrations at 20 m (see Section 4.2.1). The spring mean chl *a* concentrations have ranged from 3.2 to 13.5 µg/L from 1990 to 2001, with a 12-year mean of 6.7 µg/L. The spring means were significantly higher than mean concentrations from other seasons (ANOVA; $p < 0.05$, $n = 12$, annual means).

Summer chl *a* concentrations in the lake were usually lower because settling of the spring bloom removed much of the P from surface water, transferring it to the bottom via sedimentation. Thus, summer algal biomass in the photic zone is constrained by P availability. With higher external loading, more P would be available in the epilimnion during summer, permitting higher summer chl *a* as was the case during the period of high loading from wastewater (Edmondson, 1969).

Annual mean chl *a* concentrations in the pelagic areas were consistently less than those in nearshore areas (Figure 32), but the means were not significantly different (ANOVA; $p < 0.05$, $n = 9$, annual means). Neither was pelagic chl *a* during the more productive spring period significantly different from nearshore chl *a* (Figure 33) (ANOVA; $p < 0.05$, $n = 9$, annual means). Thus algal biomass was apparently rather evenly distributed across the lake. Moreover, the significantly higher nearshore TP concentrations apparently did not result in more algae. The rate of exchange between nearshore and pelagic water was probably too great to allow a growth response to the higher nearshore TP. In addition, nearshore TP may be elevated due to inputs of particulate P from the tributaries.

Particulate P does not provide nutrients for algae, it probably settles in the vicinity of the tributary input.

Year-to-year trends in annual mean chl *a* concentrations were not evident from 1990 through 2001 for any season separately (see Figure 30). Chl *a* may have been expected to decline from 1998 to 2001 in response to the significantly lower TP concentrations. However, even the higher concentrations during spring were not significantly different over the 12-year period (ANOVA; $p < 0.05$, $n = 3$, spring monthly means). Moreover, the spring chl *a* was only weakly related to TP concentrations, and the correlation was not statistically significant ($p < 0.05$ and $n = 10$, annual means; Figure 34). In general, year-to-year variation in chl *a* was more likely due to differences in water column stability and light availability than the relatively small differences in TP (see discussion in Section 4.2.5).

The high spring chl *a* concentrations tended to dominate annual means (Figure 35). The high annual concentrations in 1994, 1995, 2000, and 2001 corresponded with the high spring concentrations during those years (see Figure 30).

While year-to-year variations in mean chl *a* concentrations did not relate strongly with TP, even in the spring, the long-term control of TP on chl *a* and transparency becomes more convincing when the overall 10-year means are compared with model predictions (Carlson, 1977) and historical data. Figure 36 shows that the overall 10-year means fit closely to the predicted lines in spite of considerable variation among the individual yearly summer concentrations. The figure further indicates that small differences in TP are not apt to explain small year-to-year variations in chl *a*. Not withstanding year-to-year variations due largely to climatic conditions, algal biomass and transparency are strongly dependent on TP concentrations in Lake Washington over a wide range of external loading.

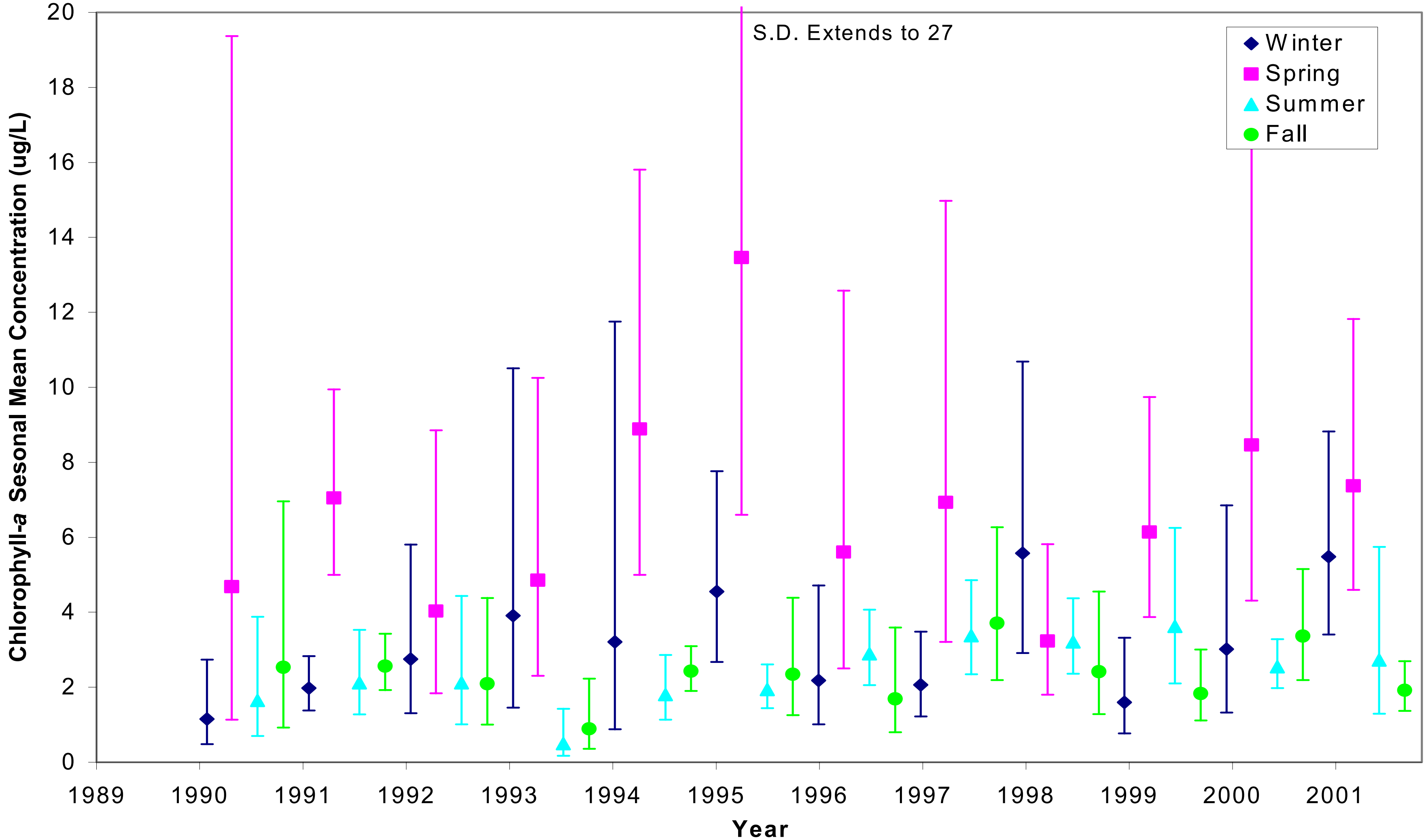

Figure 30. Seasonal Mean Chlorophyll *a* Concentrations for the Combination of Pelagic and Nearshore Stations Unweighted for Area

Note: Means +/- SD are based on log-transformed data.

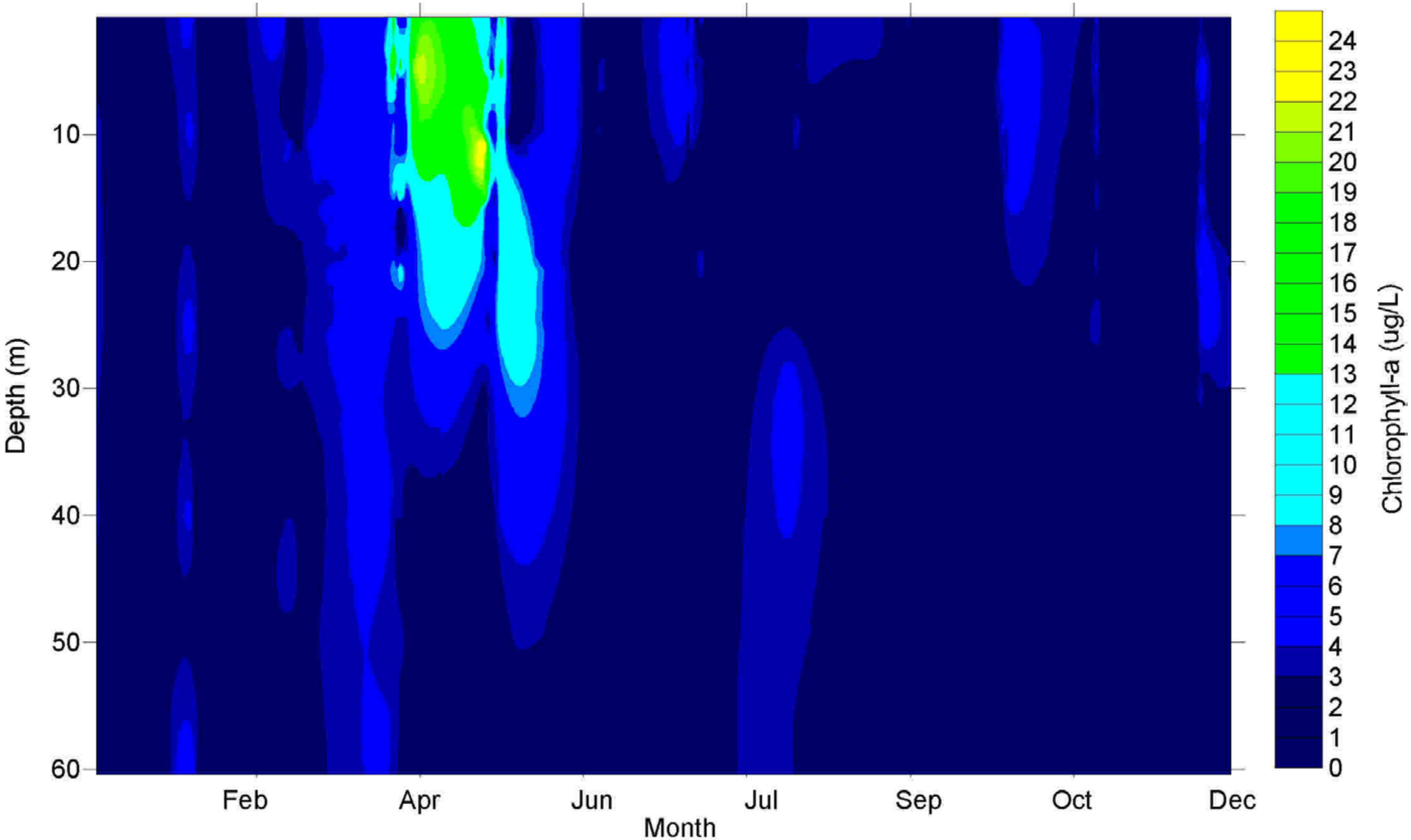

Figure 31. Isopleths of Chlorophyll *a* Concentrations at the Deep Station (0852) From 1993 to 2001

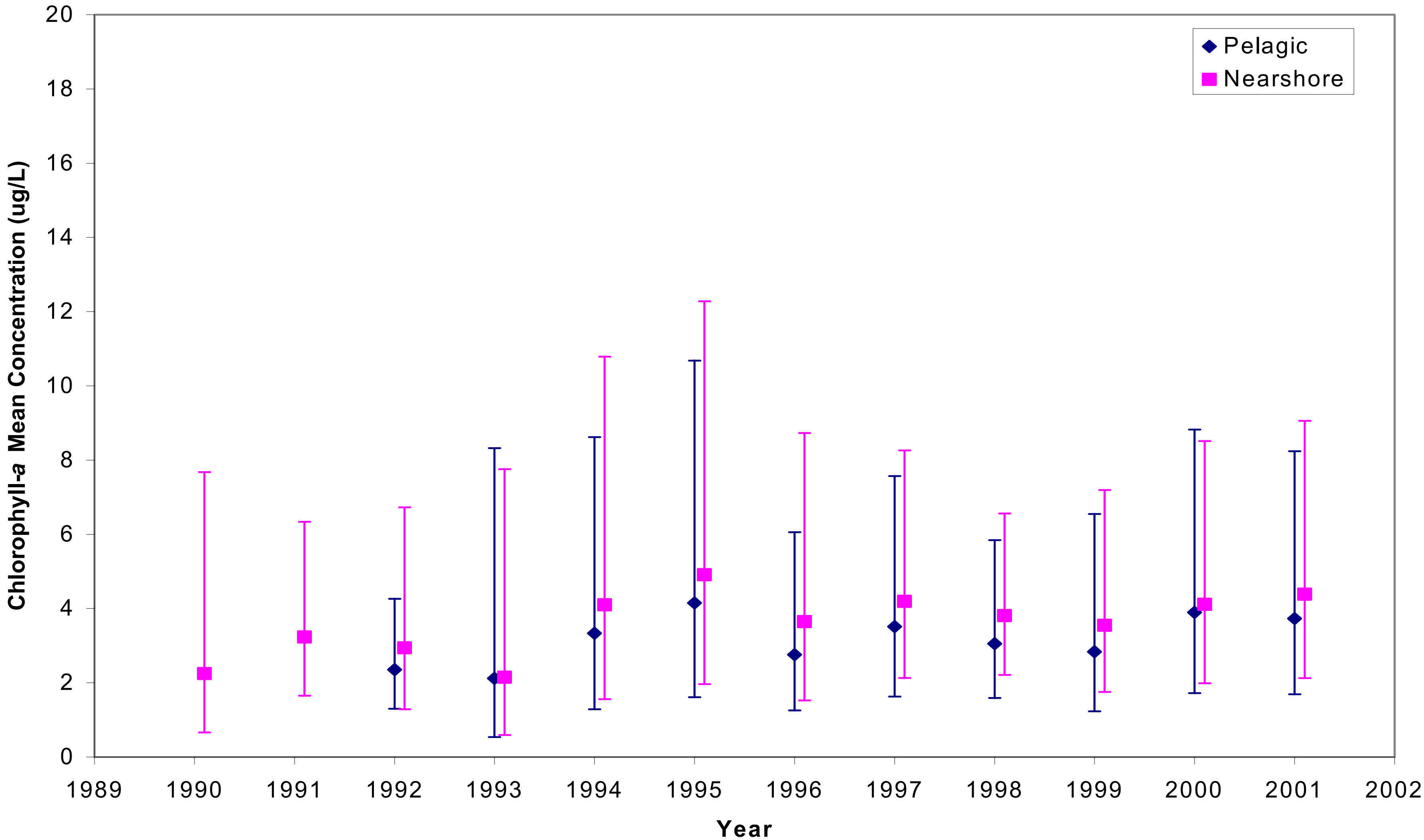

Figure 32. Annual Mean Chlorophyll *a* Concentrations for Pelagic and Nearshore Stations Unweighted for Area

Note: Means +/- SD are based on log-transformed data.

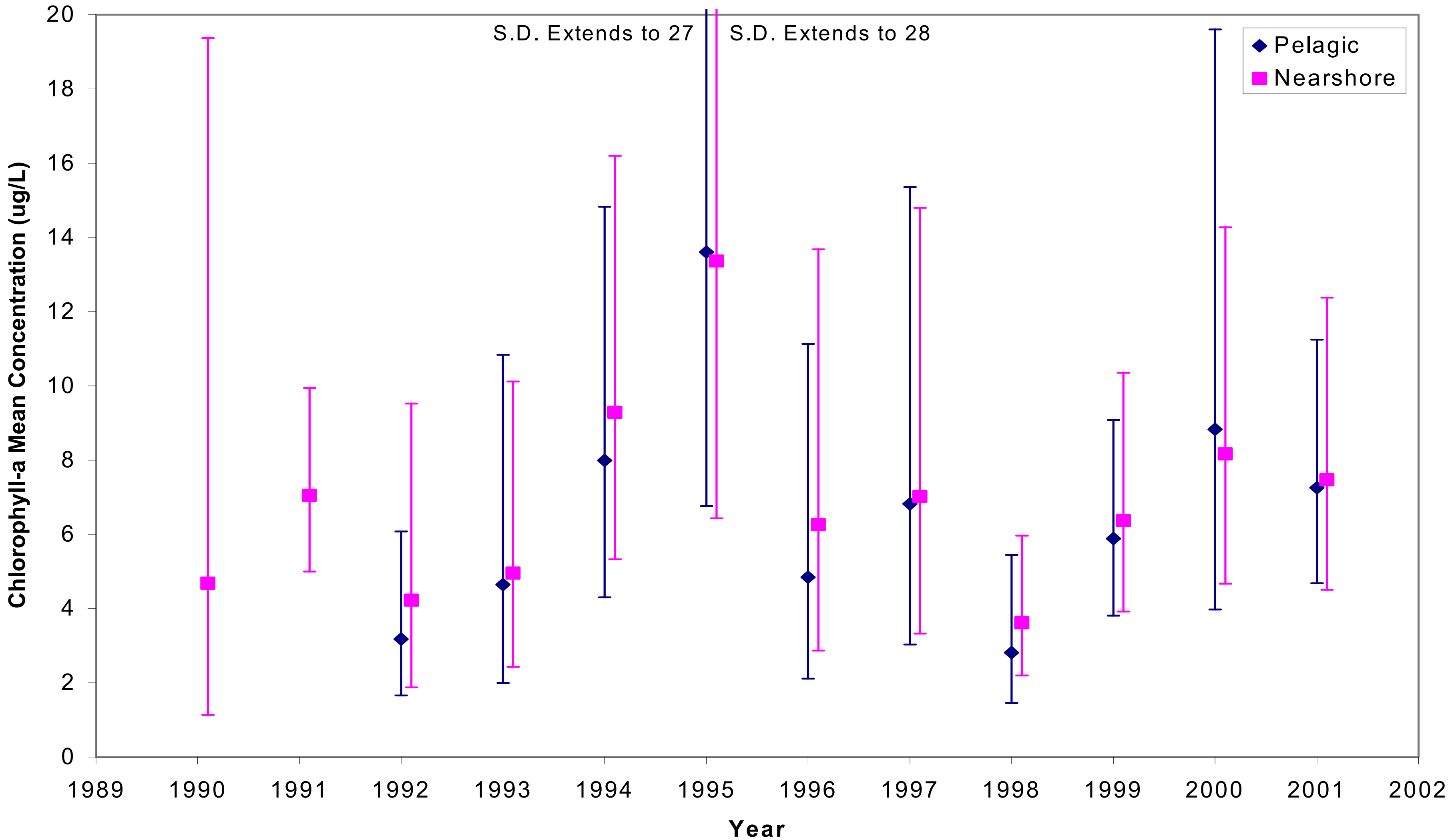

Figure 33. Spring Mean Chlorophyll *a* Concentrations for Pelagic and Nearshore Stations Unweighted for Area

Note: Means +/- SD are based on log-transformed data.

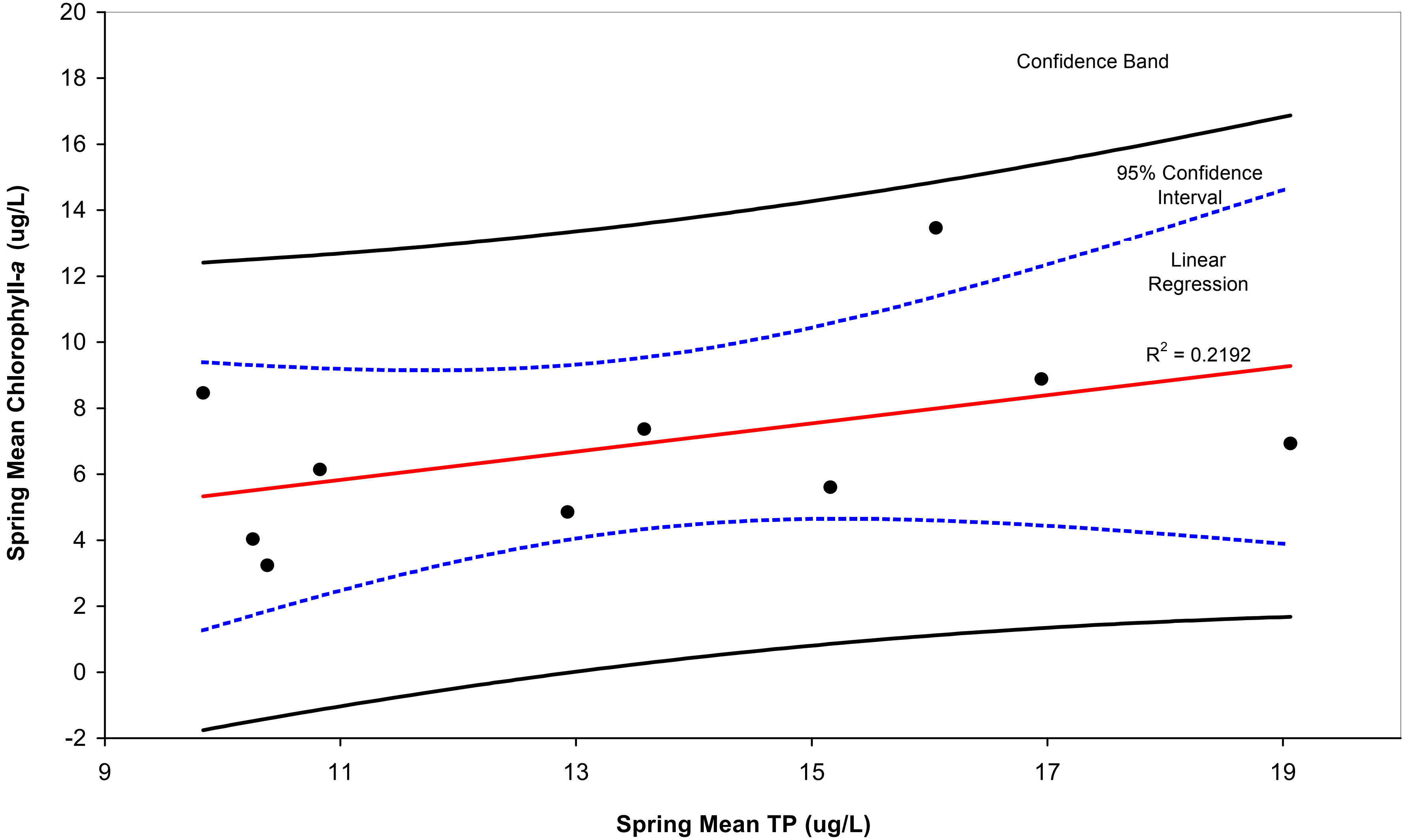

Figure 34. Relationship Between Spring Whole-Lake TP and Spring Chlorophyll *a* at Combined Stations From 1992 to 2001

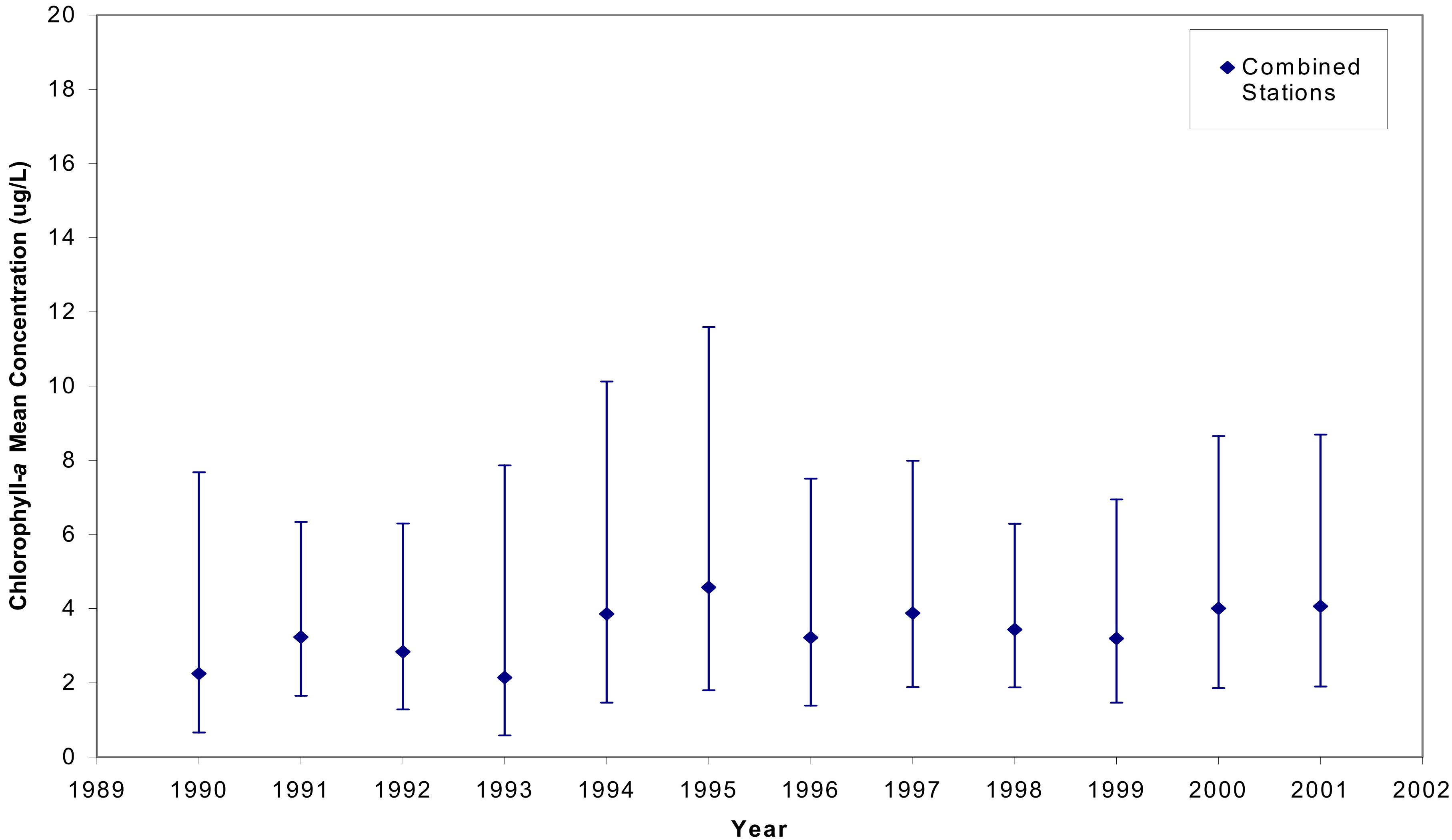

Figure 35. Annual Mean Chlorophyll *a* for Combined Pelagic and Nearshore Stations From 1990 to 2001

Note: Means +/- SD are based on log-transformed data.

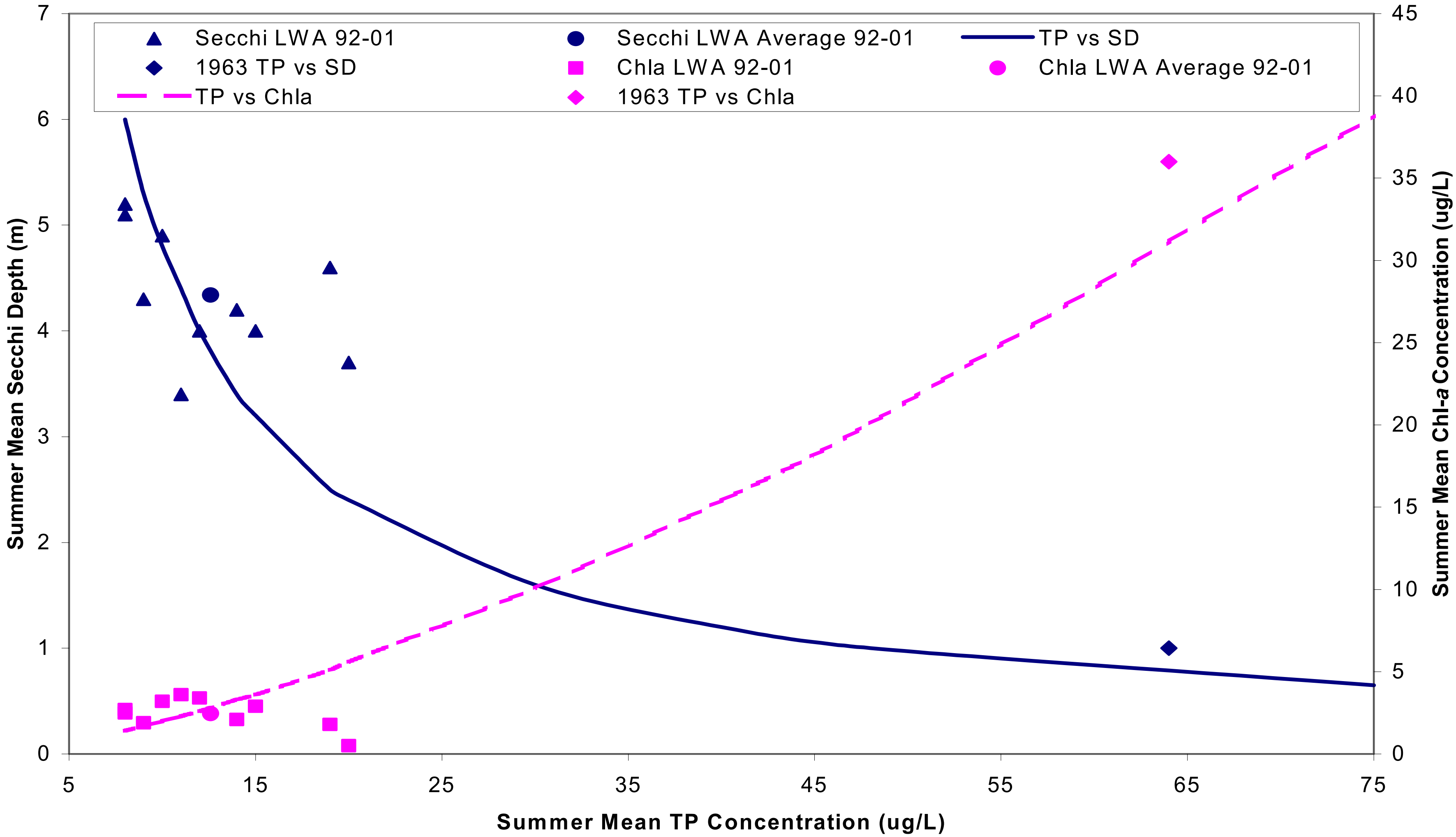

Figure 36. Relation of Chlorophyll *a*, Total Phosphorus, and Secchi Depth From 1992 to 2001 and Prior to Wastewater Diversion (1963) to the Model Predictions for Carlson's (1977) Trophic State Index

4.3.2. Fisheries

The following section contains excerpts and information from the WRIA 8 Salmon and Steelhead Habitat Limiting Factors Report (Kerwin, 2001) summarizing the current fisheries community in the Cedar-Sammamish Watershed and the current salmonids that utilize Lake Washington. For further information on the salmon population status and habitat conditions in the Cedar-Sammamish Watershed and Lake Washington, refer to the*Salmon and Steelhead Habitat Limiting Factors Report for the Cedar-Sammamish Basin (Water Resource Inventory Area 8)* (Kerwin, 2001), available from the Washington State Conservation Commission.

4.3.2.1. Current Fish Status

Many stocks of the wild salmonid population in the Cedar-Sammamish Watershed, as well as in the Puget Sound ecoregion, have declined significantly. In March 1999, the National Marine Fisheries Service (NMFS) listed Puget Sound chinook salmon as a threatened species under the Endangered Species Act (ESA). In November 1999, the U.S. Fish and Wildlife Service (USFWS) listed bull trout as a threatened species under the ESA (Kerwin, 2001).

The fisheries community in the Cedar-Sammamish Watershed comprises both native and non-native species (Tables 7 and 8). The historically important and current fishery is dominated by chinook salmon, sockeye salmon, coho salmon, kokanee, steelhead, and rainbow and costal cutthroat trout, as well as native char or bull trout (Table 7). Additionally, 24 non-native fish species have been introduced into the Cedar-Sammamish Watershed, creating numerous new trophic interactions with native species (see Table 8 for a complete list). This includes one non-native salmonid (Atlantic salmon).

Chinook Salmon

The Cedar-Sammamish Watershed supported an average yearly total run of approximately 9,600 adult chinook salmon from 1968 to 1997. This number represents the fish returning to the river and those that were harvested. However, total returns for naturally produced fish during the past 9 years have averaged less than 550 adult fish. Returns of naturally produced chinook salmon to the Cedar-Sammamish Watershed have experienced the same decline that has occurred in many of the other Puget Sound drainage basins (Kerwin, 2001).

Coho Salmon

Coho salmon escapement estimates (the number of coho salmon that survived fish predation and angler pressures) for the tributaries of Lakes Washington and Sammamish from 1980 to 1999 averaged 8,058 fish and ranged from 399 to 20,002 fish. However, escapement estimates are not always indicative of overall habitat productivity because they do not necessarily reflect the harvest of Cedar-Sammamish Watershed Basin origin subadult and adult coho salmon. The Cedar River coho salmon stock was identified as unique based on its spawn timing and its geographic isolation. However, the status of this stock appears to be on a downward trend in escapement. Between 1980 and 1999, the average escapement was 3,710 fish. While there has been insufficient or no escapement data collected in 4 of the ensuing 10 years, the most recent 2 years indicate extremely poor returns. Since 1991, where data are available, the average coho salmon escapement has been 697 fish (Kerwin, 2001). Coho salmon population decline in the Cedar-Sammamish Watershed can be attributed to spawning and rearing habitat degradation and changes in oceanic conditions.

Table 7.
Salmon Species and Stocks Found in the Cedar-Sammamish Watershed, with NMFS and USFWS Listed or Proposed ESA Listing Status as of June 2000[a]

Stock	Stock Origin	Production Type*	Stock Status (SASSI/SASI)	ESA Status (NMFS/USFWS)
Issaquah Creek Summer/Fall Chinook	Non-native	Composite**	Healthy	Listed as Threatened
North Lake Washington Tributary Summer/Fall Chinook	Native	Wild	Unknown	Listed as Threatened
Cedar River Summer/Fall Chinook	Native	Wild	Depressed	Listed as Threatened
Cedar River Coho	Mixed	Wild	Depressed	Not Currently Listed
Lake Washington and Lake Sammamish Tributary Coho	Mixed***	Composite	Depressed	Not Currently Listed
Winter Steelhead	Native	Wild	Depressed	Not Currently Listed
Lakes Washington and Sammamish Tributary Sockeye	Unknown	Wild	Depressed	Not Currently Listed
Lake Washington Beach Spawning Sockeye	Unknown	Wild	Depressed	Not Currently Listed
Lake Washington-Cedar River Sockeye	Non-native	Composite	Depressed	Not Currently Listed
Issaquah Creek Summer-Run Kokanee	Native	Wild	Critical	Petitioned as Endangered
Big Bear, Little Bear, and North Creeks Residualized Sockeye	Naturally reproducing	Wild	Unknown	NA
Late-Run Lake Sammamish Kokanee	Native	Wild	Unknown	Petitioned as Endangered
Lake Washington Rainbow Trout	Non-native	Composite	Unknown	Not Currently Listed
Chester Morse Bull Trout	Native	Wild	Unknown, but stable	Listed as Threatened
Coastal Cutthroat Trout	Native	Wild	Unknown	Not Currently Listed

[a] Excerpt from WRIA 8 Salmon and Steelhead Habitat Limiting Factors Report (Kerwin, 2001).

* Production type is the method of spawning and rearing that produces the fish, which constitutes the stock.

** A stock sustained by both wild and artificial production.

*** A stock whose individuals originated from commingled native and non-native parents, and/or by mating between native and non-native fish, or a previously native stock that has undergone substantial genetic alteration.

Table 8.
Introduced or Non-Native Fish Species Found in the Cedar-Sammamish Watershed[a]

Common Name	Scientific Name	Population Status	Origin
American shad	*Alsoa spaidissima*	Uncommon strays	E. N. America
Atlantic salmon	*Salmo salar*	Stray, can exceed 1,000/yr	N.A. & Europe
Black bullhead	*Ictalurus melas*	Extinct	E. N. America
Black crappie	*Pomoxis migromaculatus*	Common	E. N. America
Bluegill	*Lepomis macrochirus*	Common	E. N. America
Brook trout	*Salvelinus fontinalis*	Rarely caught	E. N. America
Brown bullhead	*Ictalurus nebulosus*	Rare, may be extinct	E. N. America
Brown trout	*Salmo trutta*	No observed reprod.	N. Europe
Channel catfish	*Ictalurus punctatus*	Rarely caught	E. N. America
Cherry salmon	*Oncorhynchus masou*	Extinct	Japan
Common carp	*Cyprinus carpio*	Abundant	Asia
Fathead minnow	*Pimephales notatus*	Unknown	E. N. America
Goldfish	*Carassius auratus*	Intermittent	Asia
Grass carp	*Ctenopharengodon idella*	Triploids only	Asia
Lake trout	*Salvelinus namaycush*	Extinct	NE NA+AL
Lake whitefish	*Coregonus clupeaformis*	Extinct	NE NA+AL
Largemouth bass	*Micropeterus salmoides*	Common	E. N. America
Pumpkinseed sunfish	*Lepomis gibbosus*	Abundant	E. N. America
Smallmouth bass	*Micropterus dolomieui*	Common	E. N. America
Tench	*Tinca tinca*	Abundant	Europe
Warmouth	*Lepomis gulosus*	No observed reprod.	E. N. America
Weather loach	*Misgurnus angillicaudatus*	No observed reprod.	NE Asia
White crappie	*Pomoxis annularis*	Uncommon	E. N. America
Yellow perch	*Perca flavescens*	Abundant	NE N. America

[a] Excerpt from WRIA 8 Salmon and Steelhead Habitat Limiting Factors Report (Kerwin, 2001).

Winter Steelhead

The Cedar-Sammamish Watershed winter steelhead stock has been characterized as depressed. Population declines began in the mid-1980s, similar to other Puget Sound winter steelhead stocks. These declines have been attributed to a multitude of factors, including degraded habitat, harvest, and largely to a change in ocean conditions. However, escapement estimates from recent years indicate an upward trend with the exception of poor returns in 2000 and 2001 (Kerwin, 2001).

Sockeye Salmon

In Lake Washington, there are three known production units of sockeye salmon (i.e., groups classified by spawning location). The first and largest production unit is the Cedar River population. The Cedar River produces the greatest proportion of sockeye salmon returning to the Lake Washington Basin. However, this particular stock is depressed and has a declining long-term population trend. The second production unit consists of sockeye salmon spawning in tributaries of Lake Washington other than the Cedar River. This production unit is also depressed with a declining long-term population trend. The third and smallest production unit is the Lake Washington beach spawning stock. This stock has seen the greatest declines of the three production units, for reasons that are unclear. It has been hypothesized that the construction of docks and/or the introduction and explosive distribution of Eurasian watermilfoil may be partially responsible (Kerwin, 2001).

Kokanee

Cedar-Sammamish Watershed kokanee, the resident form of sockeye salmon, have been separated into two distinct stocks based on a number of key characteristics, the most important being run timing and unique genetic traits (Young et al., 2001). The early-run stock of kokanee that return to Issaquah Creek are considered native to the Lake Sammamish drainage.

Another stock of kokanee salmon enters east and south Lake Sammamish tributaries (e.g., Laughing Jacobs, Ebright, and Lewis Creeks) from October through early January. These adult kokanee are morphologically distinct from the kokanee mentioned above, with a heavy spotting pattern along their entire dorsal surface and both caudal lobes along with varying degrees of red coloration laterally.

Finally, what has been thought to be a separate kokanee stock present in Bear Creek (sometimes referred to as Big Bear Creek) and Swamp Creek is now believed to be genetically closer to sockeye salmon and has been called a residualized sockeye stock (Young et al., 2001).

Rainbow Trout

Rainbow trout in Lake Washington have two life history strategies, the anadromous steelhead and the resident rainbow trout. The life history of the steelhead is similar to salmon species; spawning and rearing occur in freshwater, then the fish migrate to marine waters as juveniles and return to their native streams to spawn. The resident rainbow trout complete their entire life in fresh water. In WRIA 8, resident rainbow trout are hatchery-produced fish that are released into the system for "put-grow and take" or "put and take" recreational fisheries. The hatcher-produced fishery is not believed to be self-sustaining as there is no evidence of natural reproduction and recreational harvest is high (Kerwin, 2001).

Coastal Cutthroat Trout

Assessing populations of coastal cutthroat trout in the Cedar-Sammamish Watershed Basin is particularly difficult. Ludwa et al. (1997) estimated the abundance of coastal cutthroat trout in McAleer Creek at 8 fish per 50 m of stream (Kerwin, 2001). In that same study, the number of coastal cutthroat trout in Lyons Creek was estimated at 30 fish per 50 m of stream. Scott et al. (1986) examined Kelsey Creek in 1979 and found 4 to 5 fish per 50 m, but that was increased to 23 fish per 50 m in 1996 (Ludwa et al., 1997).

Native Char (Bull Trout)

There are known reproducing populations of both adfluvial and stream-resident bull trout in the upper Cedar River, in and above Lake Chester Morse (Berge and Mavros, 2001). Adfluvial populations spend much of their lives in lakes but spawn and rear in streams. The stream-resident populations complete their entire life history in streams. Bull trout have been observed in the lower Cedar River below Landsberg (Berge and Mavros, 2001). Surveys were conducted in 2001 and 2002 in tributaries to the lower Cedar River to determine if a self-sustaining population exists in the lower Cedar River Basin. A native char population may also occur in Issaquah Creek, as indicated by a single observation of a char in Carey Creek, a tributary located in the upper Issaquah Creek Basin (Berge and Mavros, 2001). Further surveys for char populations were proposed for 2001 and 2002 to determine the presence and distribution of native char in the Issaquah Creek Basin. Redd counts conducted from 1992 to 2000 ranged from 2 to 236 redds, but turbidity decreased the viewing conditions in some years, and likely caused underestimation of the number of redds (Kerwin, 2001).

Lake Washington Salmonids

The five salmonid species that use Lake Washington are sockeye salmon, coho salmon, chinook salmon, coastal cutthroat trout, and rainbow/steelhead trout (Table 9). Anadromous forms of each of these species are present, so individuals are present in the lake both as adults during migrations to spawning grounds and as juveniles. Sockeye salmon are known to spawn along some beaches of the lake, and there are unconfirmed reports of chinook salmon spawning in littoral or shallow shoreline areas of the lake (Kerwin, 2001).

Table 9.
Salmonid Species that Utilize Lake Washington

Common Name	Scientific Name
Chinook salmon	*Oncorhynchus tshawytscha*
Sockeye salmon	*Oncorhynchus nerka*
Coastal cutthroat trout	*Oncorhynchus clarki clarki*
Rainbow/steelhead trout	*Oncorhynchus mykiss*
Coho salmon	*Oncorhynchus kisutch*

Populations known to reside specifically in Lake Washington include non-anadromous forms of winter steelhead (rainbow trout), sockeye salmon (kokanee), and cutthroat. Resident rainbow trout spend their entire life in Lake Washington. The resident rainbow trout population was sustained with hatchery plants because they rarely successfully reproduce in WRIA 8 (Beauchamp, 1987). Recently, however, releases of hatchery rainbow trout have been all but eliminated. Non-anadromous coastal cutthroat trout also occur in Lake Washington and are much more abundant than the anadromous form (Nowak, 2000). Kokanee is the freshwater, resident form of *O. nerka*, sockeye salmon (Foote et al., 1989; Wood, 1995). Some progeny from the parents of anadromous sockeye salmon may also remain in Lake Washington for all or a portion of their lives (resident/anadromous sockeye) (Kerwin, 2001).

Salmonids primarily use two major habitat zones of the lake: the littoral and limnetic regions. The littoral zone is defined as the shallow water portion of the lake associated with the shoreline; the limnetic zone is the water column portion of the lake extending down to, but not including, the lake's bottom. These two habitat zones have been impacted and altered by human activities throughout the watershed. The alteration of habitat zones in Lake Washington is believed to have an impact on the salmonid species that utilize the lake. Below is a summary of the limiting habitat factors and impacts on Lake Washington and its salmonid population (Kerwin, 2001):

- The riparian shoreline of Lake Washington is highly altered from its historic state. Current and future land-use practices all but eliminate the possibility of the shoreline functioning as a natural shoreline to benefit salmonids because of the lack of structure and shoreline vegetation, as well as hydraulic changes due to bulkheads and docks.
- Introduced non-native plant and animal species have altered trophic interactions between native animal species.
- Riparian habitats are generally non-functional and are disconnected.

4.4. Trophic State Indices

Trophic state indices (TSIs) were developed by Carlson (1977) to provide a tool to apply TP, Secchi transparency, and chl *a* values to a uniform scale that can be used to compare lake condition. The mathematical relationship allows for the conversion of TP, Secchi transparency, and chl *a* values to an index number for each parameter between 0 and 100. The greater the index number, the more eutrophic the lake. The agreement between summer average Secchi transparency, chl *a*, and TP for Lake Washington with Carlson's relationships was discussed in Section 2 and shown in Figure 36 (complete data set can be found in Table A-26, Appendix A). Carlson's computational equations are:

$$\mathrm{TSI}_{(SDD)} = 10\left(6 - \left(\frac{\ln \mathrm{SDD}}{\ln 2}\right)\right)$$

SDD = Secchi disk depth, m

$$\mathrm{TSI}_{(Chla)} = 10\left(6 - \left(\frac{2.04 - 0.68 \ln \mathrm{Chl}\, a}{\ln 2}\right)\right)$$

Chl *a* = Chlorophyll *a*, mg/m^3

$$\mathrm{TSI}_{(TP)} = 10\left(6 - \left(\frac{\ln(48/\mathrm{TP})}{\ln 2}\right)\right)$$

TP = Total phosphorus, μg/L

The TP-TSIs in Lake Washington show a statistically significant decline (t-test, 95% confidence interval) comparing 1998 through 2001 to earlier years, suggesting a shift from mesotrophic to lower mesotrophic or upper oligotrophic (Figure 37). This is consistent with decreased TP concentrations measured during those years (see Figure 16). The cause or causes of the TP decline have not been identified at this time. Secchi-TSIs showed a similar decline in the last four years of this study (Figure 38). Chl *a*-TSI did not show a corresponding decline (Figure 39), and in fact, increased significantly at the nearshore sites. This range of TSI values for all three constituents (32 to 49) indicates that Lake Washington is mesotrophic.

TSIs are often used to determine if something is limiting chl *a* other than TP, such as turbidity and light (Carlson, 1977). Carlson provided a method of charting the TSI 'residuals' to visually demonstrate areas of inconsistency between indicators (Figure 40a and 40b). Points that fall within the center area (+/- 5 on both axis) represent years in which the three indicators are in general agreement. For most years in this study period, residual TSI values for Lake Washington fell within the center axis range, suggesting agreement between the indicators. If chl *a* was limited by something other than TP, the TSI for chl *a* would be much lower than TSIs for TP and Secchi and the TSI residual point would end up in the lower left quadrant. This occurred at both nearshore and pelagic stations in 1993.

The TSI residuals for the pelagic stations in 1998, 2000, and 2001 fall within the upper right quadrant due low TP and high water clarity – this can occur when algal communities are dominated by larger species/colonies between which the Secchi disk remains visible at high concentrations of chlorophyll *a*. As discussed previously, the magnitude of the spring blooms (March/April) are likely determined more by other factors such as the availability of light and zooplankton-phytoplankton dynamics, than by TP. Arhonditsis et.al. (2003) found that while zooplankton played a dominant role in determining the phytoplankton maximum, it was not clear whether grazing rates or nutrient limitation is the primary cause for the decline in phytoplankton biomass following the spring bloom. They also suggest that since nutrient recycling by zooplankton (*Daphnia pulicaria* and *Daphnia thorata*) provides 60 to 90 percent of the phosphorus input to the mixed layer (Richey 1979), that phytoplankton-*Daphnia* dynamics are a significant regulatory factor for the phytoplankton community properties (abundance and composition) from late spring until the end of September (Schindler unpublished data). Changes in the phytoplankton-*Daphnia* dynamics in recent years may have resulted in less zooplankton nutrient recycling in the mixed layer and perhaps changes in dominant chlorophytes and/or cyanobacteria from late spring to fall. Zooplankton and phytoplankton species and composition were not investigated for this report.

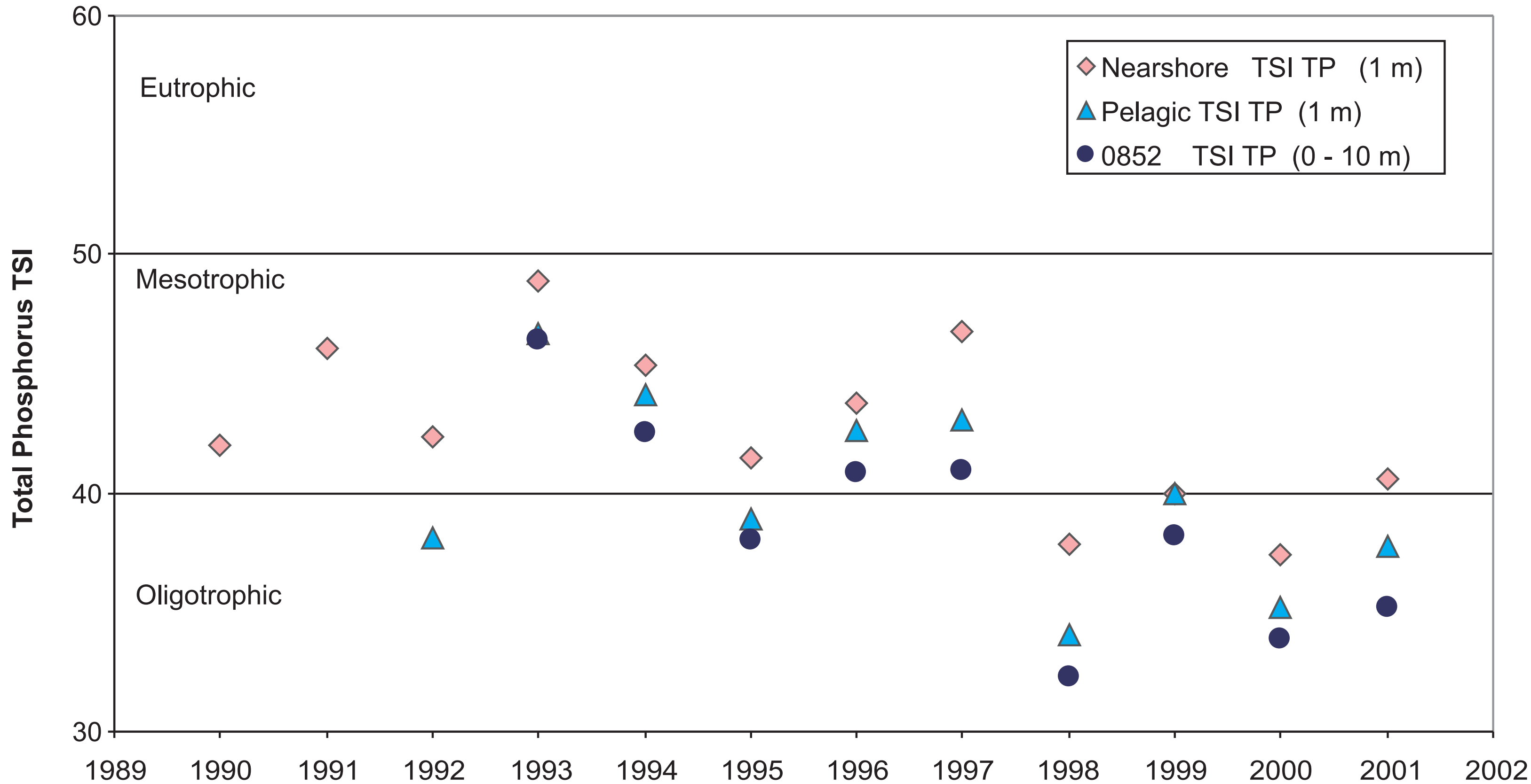

Figure 37. Summer Mean (May - Sept) Total Phosphorus Trophic State Index for Nearshore Stations, Pelagic Stations, and Station 0852.

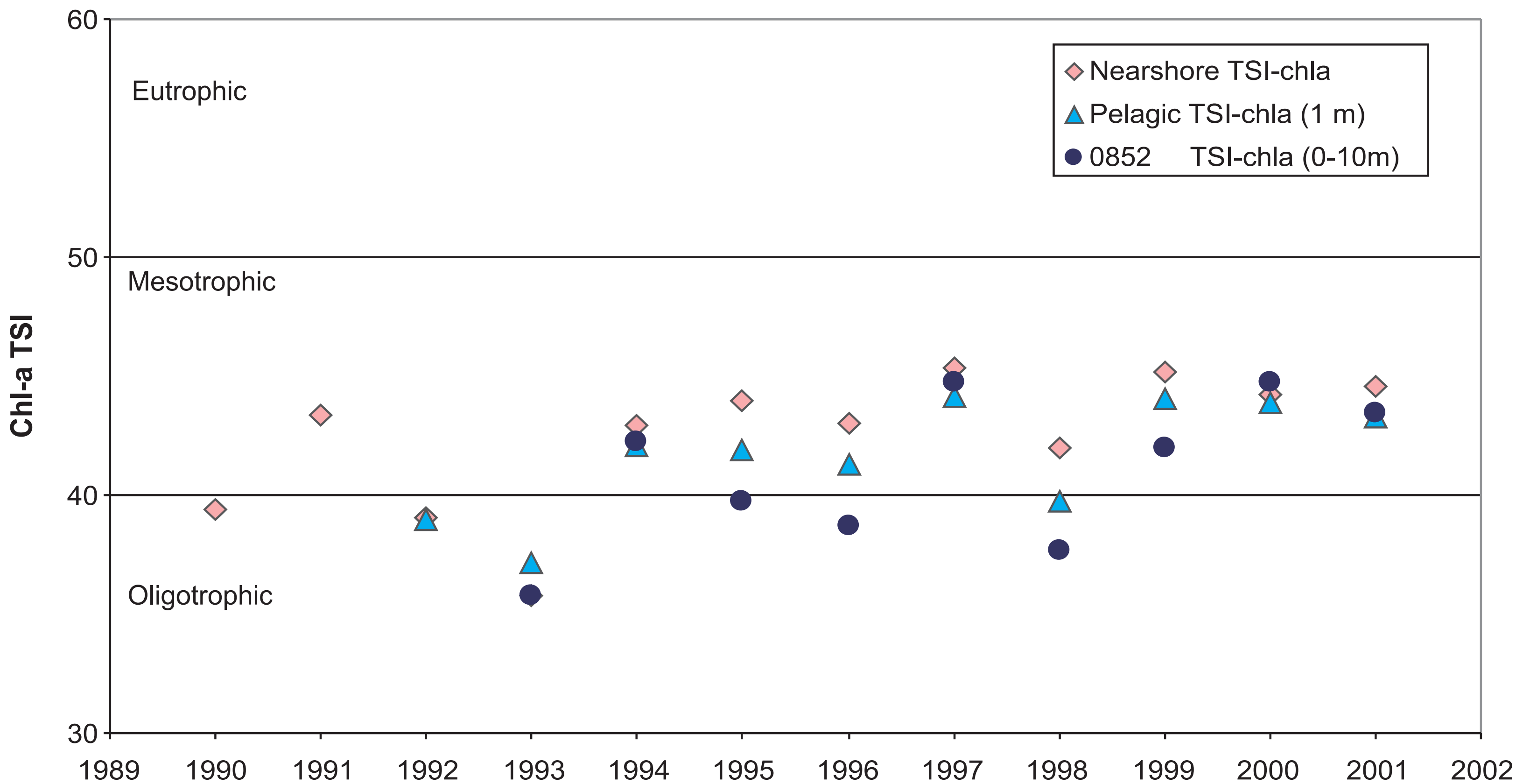

Figure 38. Summer Mean (May - Sept) Chl-a Trophic State Index for Nearshore Stations, Pelagic Stations, and Station 0852.

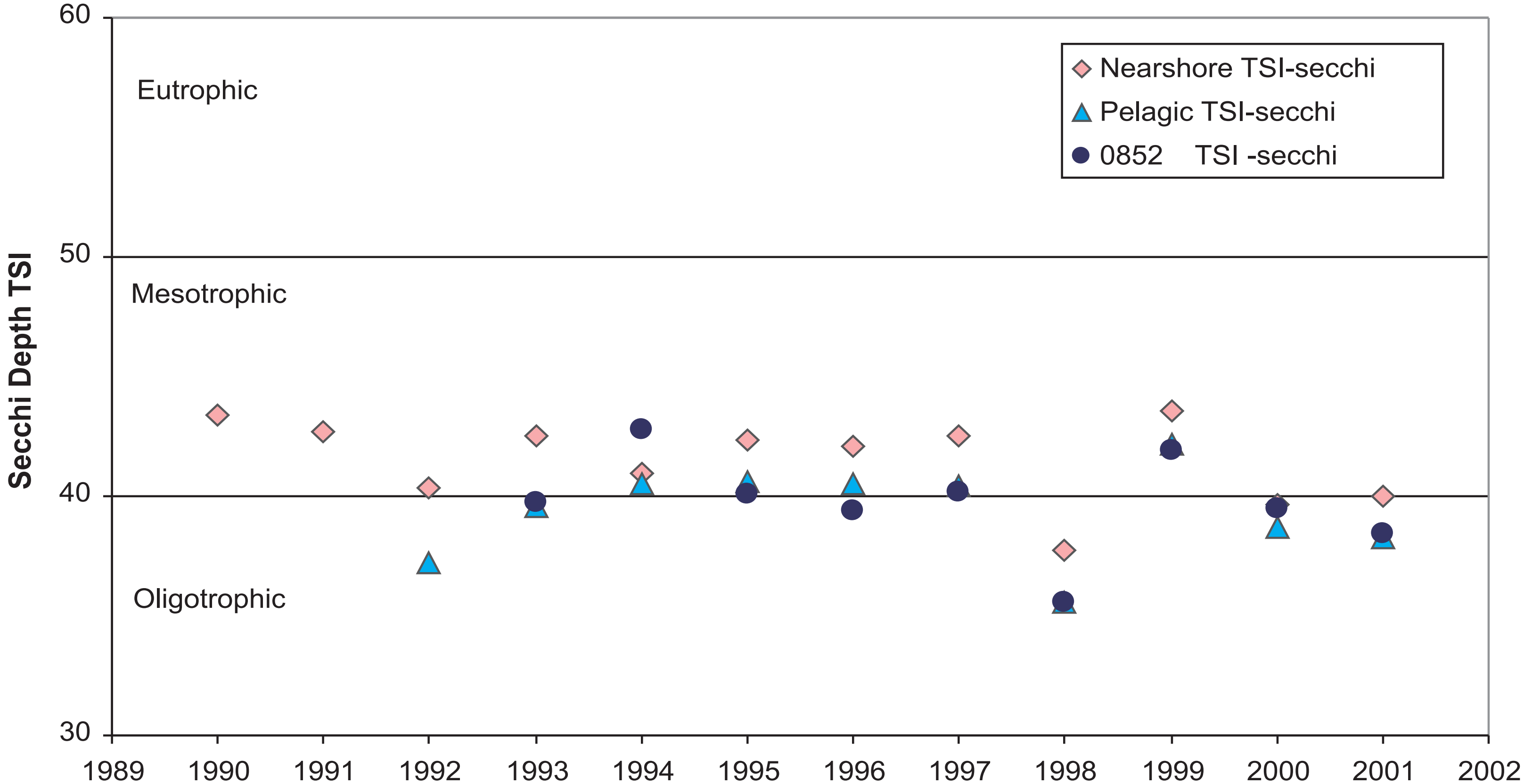

Figure 39. Summer Mean (May - Sept) Secchi Depth Trophic State Index for Nearshore Stations, Pelagic Stations, and Station 0852.

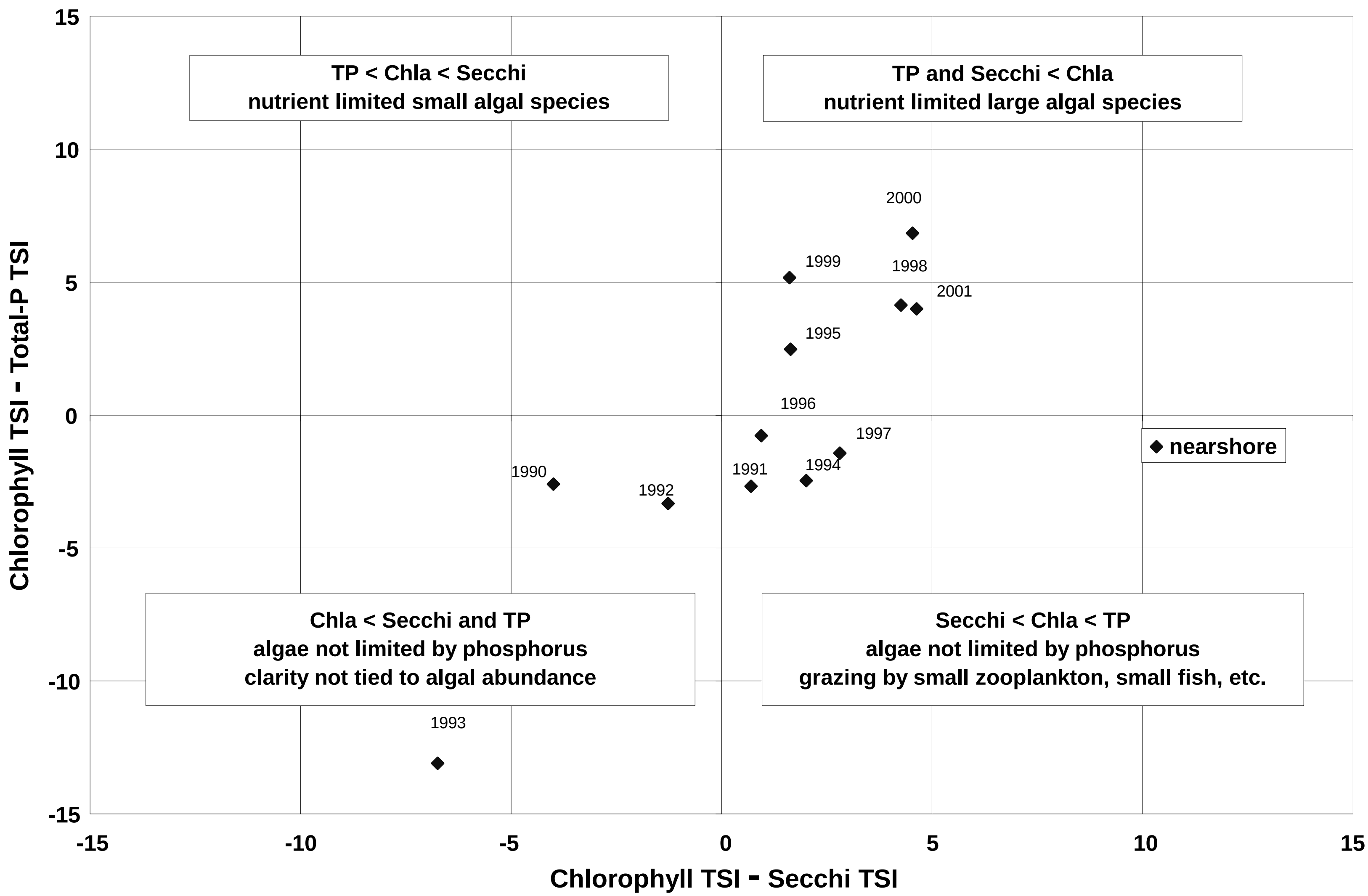

Figure 40a. Summer Mean (May - Sept) Trophic State Indices Residuals for Lake Washington Nearshore Stations 1990 - 2001.

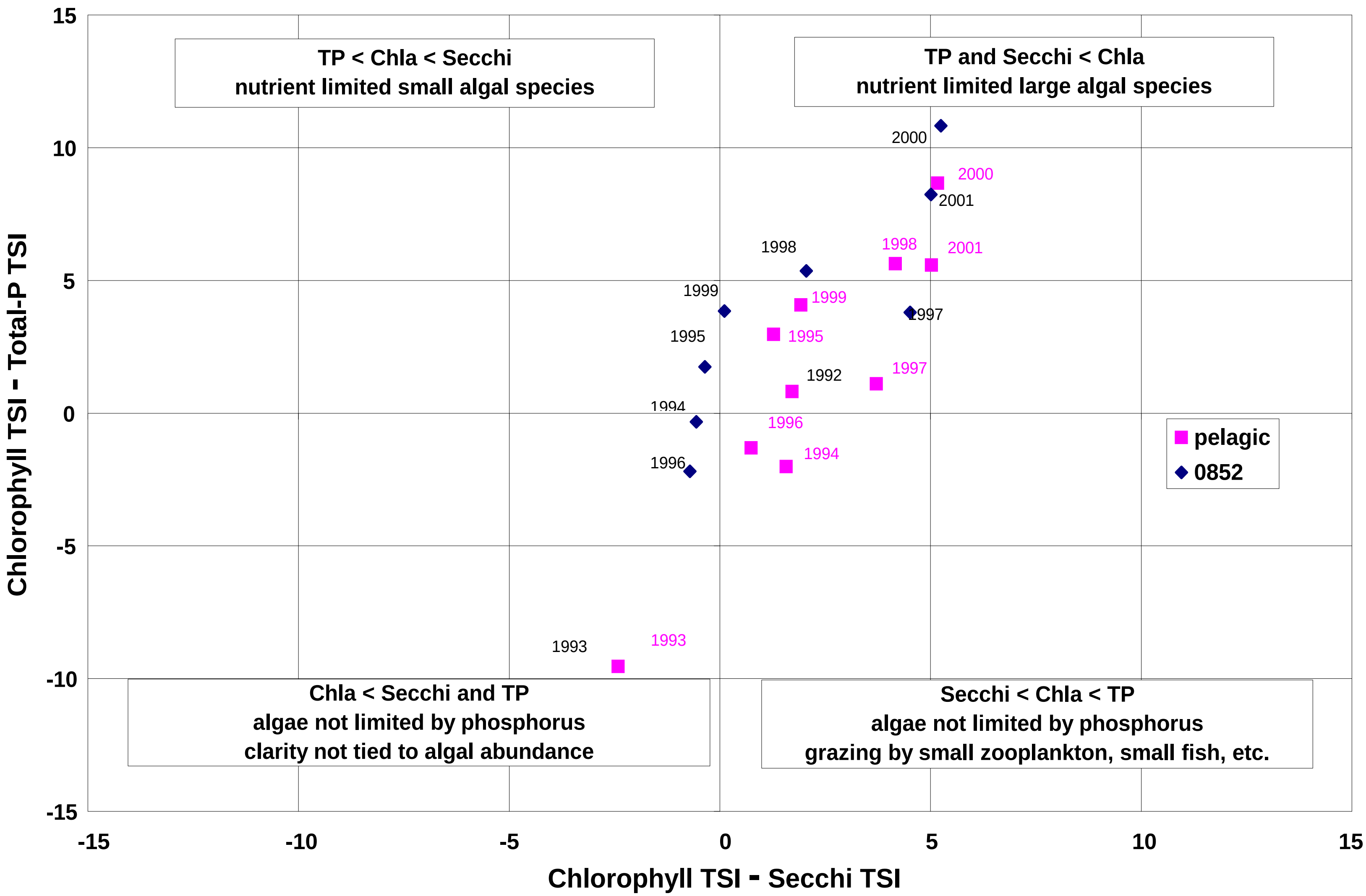

Figure 40b. Summer Mean (May - Sept) Trophic State Indices Residuals for Lake Washington Pelagic Stations and Station 0852 from 1992 to 2001.

4.5. Metals and Organics

4.5.1. Metals Analysis

Lake water was analyzed for 21 metals (dissolved + total) (see Table B-1 in Appendix B for the list of analytes), 18 of which were detected at concentrations greater than the method detection limit (MDL) (Table 10). Table A-25 in Appendix A contains summary statistics for all metals analyzed. Sampling for metals and organic constituents in Lake Washington was recently initiated as part of the SWAMP project; very few data are available prior to 2000.

King County's Major Lakes Monitoring Program and the King County Environmental Laboratory (KCEL) have used inductively coupled plasma mass spectrometry (ICP-MS; USEPA methods 200.8 and 6020) to measure metal concentrations since 1998. ICP-MS is capable of achieving the detection limits required to detect metals at typical ambient water concentrations. Methods used prior to 1998, such as inductively coupled plasma optical emission spectroscopy (ICP-OES; USEPA methods 200.7 and 6010), had detection limits 5 to 20 times higher than ICP-MS, and did not detect metals at typical ambient concentrations.

Mercury is analyzed using cold vapor atomic absorption (CVAA; USEPA method 245.2) or cold vapor atomic fluorescence (CVAF; USEPA 1631 modified).

In samples where metals were not detected, one-half the MDL was assumed as the maximum metal concentration.

Table 10.
Metals Detected in Lake Washington Water Samples at Concentrations Greater Than Method Detection Limit for Method Indicated

Aluminum, dissolved, ICP-MS	Cobalt, dissolved, ICP-MS	Molybdenum, dissolved, ICP-MS
Aluminum, total, ICP	Cobalt, total, ICP-MS	Molybdenum, total, ICP-MS
Antimony, dissolved, ICP-MS	Copper, dissolved, ICP-MS	Nickel, dissolved, ICP-MS
Antimony, total, ICP-MS	Copper, total, ICP-MS	Nickel, total, ICP-MS
Arsenic, dissolved, ICP-MS	Iron, dissolved, ICP	Silver, total, ICP-MS
Arsenic, total, ICP-MS	Iron, total, ICP	Thallium, dissolved, ICP-MS
Barium, dissolved, ICP-MS	Lead, dissolved, ICP-MS	Thallium, total, ICP-MS
Barium, total, ICP-MS	Lead, total, ICP-MS	Mercury, total, CVAF
Calcium, dissolved, ICP	Magnesium, dissolved, ICP	Vanadium, dissolved, ICP-MS
Cadmium, total, ICP-MS	Magnesium, total, ICP	Vanadium, total, ICP-MS
Chromium, dissolved, ICP-MS	Manganese, total, ICP-MS	Zinc, dissolved, ICP-MS
Chromium, total, ICP-MS	Mercury, total, CVAA	Zinc, total, ICP-MS
	Mercury, dissolved, CVAF	

4.5.2. Organics Analysis

Lake water was analyzed for 163 organic compounds (see Table B-2 in Appendix B for the list of analytes). Twenty organic compounds were detected at concentrations greater than their MDLs (Table 11). See Table A-25 in Appendix A for summary statistics for all organics analyzed.

Table 11.
Organic Compounds Detected in Lake Washington Water Samples at Concentrations Greater Than Method Detection Limit

2,4-D	Benzo(k)fluoranthene	Fluoranthene
2-Nitrophenol	Bis(2-Ethylhexyl)Phthalate	Indeno(1,2,3-Cd)Pyrene
Acenaphthylene	Caffeine	Isophorone
Benzo(a)pyrene	Chrysene	Naphthalene
Benzo(b)fluoranthene	Dimethyl Phthalate	Phenanthrene
Benzo(g,h,i)perylene	Di-N-Octyl Phthalate	Phenol
Pyrene	Total PAH Immunoassay	

4.5.3. Metals and Organic Compounds Compared to Water Quality Standards

Concentrations of metals and organic compounds in Lake Washington water samples were compared to *Water Quality Standards for Surface Waters of the State of Washington* (WAC 173-201A) to assess how well Lake Washington meets concentrations established to protect beneficial uses (e.g., public health, fish and wildlife use, and recreation). These standards include numeric criteria[1] established for protection of aquatic life, including both acute and chronic exposure concentrations.

WAC standards for the compounds analyzed are summarized in Table 12. Many of the metal standards are hardness-dependent. The hardness-dependent standards were calculated using the mean sample hardness of 37.2 mg/L (see Table C-1 in Appendix C for the hardness-dependent water quality standard equations). The standard deviation of hardness was only 2.0 mg/L (n = 455 samples). Therefore, use of the mean hardness was considered appropriate for calculating hardness-dependent metal water quality standards.

Within the study period, a single metals sample exceeded WAC numerical standards. Dissolved lead, reported as 1.39 µg/L on January 7, 2002, at Station 0826 (mid-lake off Sand Point), exceeded the chronic standard of 0.715 µg/L. Dissolved lead (ICP-MS) concentrations are plotted by date in Figure 41. The highest dissolved lead concentration was compared to the 14 other samples containing dissolved lead above the MDL; using Grubb's test for detecting outliers, this concentration was found to be an outlier. Lead concentrations in samples collected on January 7, 2002, from Station 0831 (mid-lake south), Station 0852 (Madison Park), and Station 0890 (south of I-90, south-central basin), while below water quality standards, were also elevated compared to samples

[1] Criteria refers to the maximum concentration of a chemical allowed under national or state regulations.

previously collected. With the most elevated lead levels occurring on January 7, 2002, at three different stations, sample contamination could have occurred in the lab, or lead levels may have been elevated in Lake Washington that day. The implication of the lead criteria exceedance will be examined in the screening level risk assessment.

Table 12.
Washington State Freshwater Acute and Chronic Numerical Water Quality Standards for Protection of Aquatic Life for Compounds Analyzed

Parameter Analyzed	Acute Standard (µg/L)	Chronic Standard (µg/L)
Aldrin	2.5	0.0019
Arsenic, dissolved	360	190
Cadmium, dissolved	1.21[a]	0.47[a]
Chlordane	2.4	0.0043
Chloride	860,000	230,000
Chlorpyrifos	0.083	0.041
Chromium (III), dissolved	244.1[a]	79.2[a]
Copper, dissolved	6.70[a]	4.88[a]
4,4'-DDD	1.1	0.001
4,4'-DDE	1.1	0.001
4,4'-DDT	1.1	0.001
Endosulfan	0.22	0.056
Endrin	0.18	0.0023
Gamma-BHC (Lindane)	2	0.08
Heptachlor	0.52	0.0038
Lead, dissolved	18.34[a]	0.715[a]
Mercury, dissolved	2.10	-
Mercury, total	-	0.012
Nickel, dissolved	613[a]	68.1[a]
Parathion	0.065	0.013
Pentachlorophenol (PCP)	9.07[b]	5.73[b]
Polychlorinated Biphenyls (PCBs) or Aroclors	2.0	0.014
Selenium, total	20	5
Silver, dissolved	0.63[a]	-
Toxaphene	0.73	0.0002
Zinc, dissolved	49.5[a]	45.2[a]

[a] Indicates hardness-dependent standard. Average hardness of 37.2 mg/L was used to calculate these criteria.

[b] Indicates pH-dependent standard. A pH of 7 was used to calculate these criteria.

No organic compounds exceeded WAC numerical standards.

With regard to concentrations of metals and organic compounds, Lake Washington demonstrates generally very good water quality. Based on analysis of samples collected in 2000 and 2001, with the exception of lead in one sample, concentrations of metals and organic compounds in Lake Washington are below Washington State chronic and acute water quality standards.

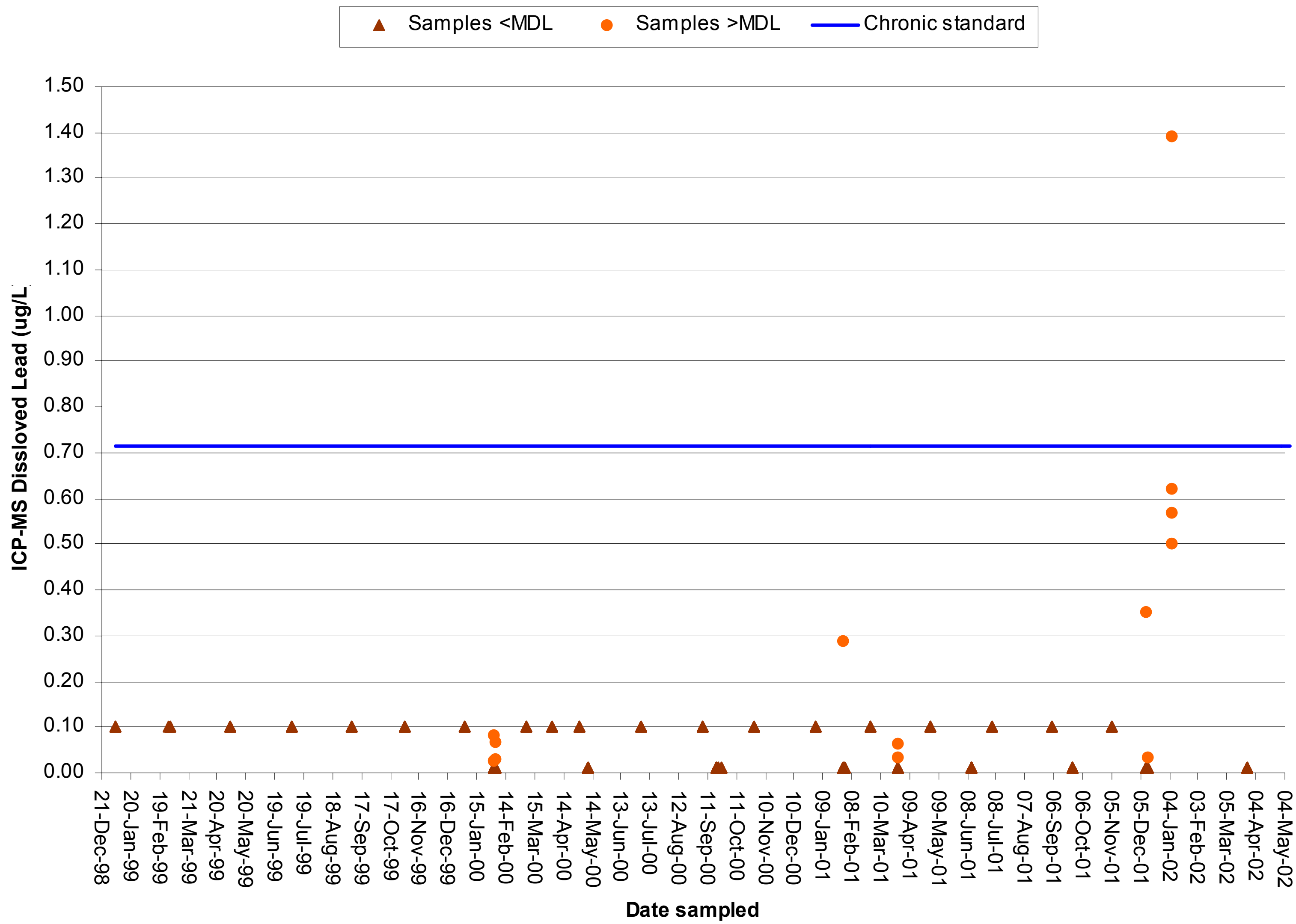

Figure 41. Dissolved Lead (ICP-MS) Sample Concentrations by Date, Compared to WAC Chronic Standard

5. PROJECT OVERVIEW

This report summarizes water quality conditions and trends in Lake Washington using water quality data collected from 1990 through 2001 as part of the Major Lakes Monitoring Program. This dataset was analyzed to develop a current conditions benchmark of lake water quality water quality trends in Lake Washington as a component of the Sammamish-Washington Analysis and Modeling Program (SWAMP). The purpose of SWAMP is to assist wastewater capital planning, habitat conservation, salmon recovery, and watershed planning efforts by collecting information and by developing and using a set of scientific tools to better understand the Sammamish-Washington Watershed system. This is the first of three reports to evaluate each of the three major lakes, Washington, Sammamish, and Union in the SWAMP study area.

This study describes and documents how Lake Washington has responded over this 10-year period to watershed activities, nutrient inputs, ecological interactions, and seasonal or year-to-year variability.

Specifically, water quality data were analyzed with the following objectives:

- To describe the current status of the lake's quality relative to ecological indicators, such as transparency (water clarity), dissolved oxygen (DO), total phosphorus (TP), and chlorophyll *a* (chl *a*).
- To describe the trends in water quality during the study period, with reference to historical conditions where applicable.
- To describe current similarities and differences in water quality between nearshore (littoral) and deep open water (pelagic) areas of the lake.
- To provide information for use in making future environmental management decisions.

6. SUMMARY OF FINDINGS

Data collected from 1990 through 2001 indicate that the quality of Lake Washington's water supports and is consistent with the lake's beneficial uses. Lake Washington water quality is indicative of mesotrophic, or moderately productive lake conditions, based upon the standard lake indices (i.e., nutrients, AHOD, chlorophyll-*a*, Secchi disk transparency).

6.1. Phosphorus and Nitrogen

Total phosphorus concentrations in Lake Washington are primarily a reflection of the large volume of water entering from the Cedar River and its relatively low P concentration. Essentially, the Cedar River is diluting the other sources of phosphorus entering the lake (e.g., Sammamish River, other tributaries, nearshore runoff). Without the high-quality Cedar River providing 50 percent of the inflow to the lake, the quality of Lake Washington would be many times poorer; given that 63 percent of the immediate watershed is urbanized and that the other inflows have a combined mean total phosphorus concentration roughly 3 times greater than the Cedar River.

Phosphorus trapped in the sediments in Lake Washington is not recycled through the water column. While the lake does strongly stratify, the period of stratification is not long enough nor the oxygen demand high enough for the oxygen concentrations in the hypolimnion to reach a state of anoxia given the current rate of depletion. The nine-year (1993 – 2001) areal hyplolimnetic deficit rate (AHOD) was 473 ± 89 mg/m^2-day, placing the lake somewhere between mesotrophic and eutrophic depending upon the standard used. The recent values are about half the high rate prior to wastewater diversion; AHOD in 1964 was 810 mg/m^2-day (Welch and Perkins 1979b). Given the depth of the hypolimnion, either the rate of depletion would need to be greater or the period of stratification would need to be longer in order to reach anoxia. The minimum dissolved oxygen concentrations measured near the bottom from 1993 to 2001 did not drop below 2.5 mg/L.

There has been a statistically significant decreasing trend in whole lake volume weighted total phosphorus concentrations from 1993 to 2001. Annual mean concentrations for 1998 through 2001 were substantially lower than means observed in the previous six years. The lower whole-lake volume weighted TP in recent years is due in part to a statistically significant decline in hypolimnetic TP from 1992 to 2001. No trend is indicated for epilimnetic TP over the same period, although the epilimnion TP concentrations remain low enough to maintain relatively high water quality. The reason for the decrease in total phosphorus concentrations since 1998 has not been identified. However, a similar decrease in whole-lake total phosphorus has been noted in Lake Sammamish, and Lake Sawyer, two relatively large lakes in the County's monitoring program.

Like phosphorus, near shore total nitrogen (TN) concentrations were consistently higher than pelagic areas. Higher nitrate-nitrogen concentrations in the winter season were likely due to the influence of stormwater runoff. Prior to 2001, it appeared that total nitrogen concentrations were increasing over time in both the epilimnion and hypolimnion. However, the relatively low annual mean for 2001 counters any statistical significance.

Whole-lake TN to TP ratios ranged from 13:1 to 30:1, indicating that P was limiting algal growth. There was a trend toward increasing TN:TP ratios in the lake from 1994 through 2001, which indicates that Lake Washington has become increasingly limited by P. Most of the management options that have been implemented in the last decade were designed to reduce inputs of TP to the lake. The dramatic decrease in the N:P ratio that occurred in 2001 was due in part to a decrease in TN concentrations observed in 2001.

Nearshore volume-weighted mean TP and TN concentrations were statistically significant greater than the pelagic means. This would be expected given that most of the tributaries have higher nutrient concentrations than the ambient lake water. The larger volume in the pelagic portion of the lake, dominated by the Cedar River inflows, dilutes the effect of the higher nearshore concentrations beyond the immediate stream inflow area.

6.2. Chlorophyll-a

Chl *a* concentrations declined sharply from 1969 to 1970 in response to the decrease in phosphorus following waterwater diversion (Edmondson, 1970). Chl *a* declined again in 1976 when zooplankton grazing increased (Edmondson and Litt, 1982). The annual chl *a* 12-year mean was 3.4 µg/L with a summer 12-year mean of 2.4 µg/L. These concentrations indicate that the algal biomass remains low and the lake is mesotrophic.

Spring chl *a* concentrations were statistically significant higher than chl *a* concentrations for other seasons. Highest chl *a* concentrations occurred during spring with the usual bloom of diatoms, which were the most commonly occurring algae in Lake Washington. During this bloom, epilimnetic chl *a* concentrations peak on average at 10 µg/L, which is three times greater than during summer stratified conditions (G. Arhonditsis, et. al. 2003). Analysis conducted by Arhonditis suggests that the phytoplankton community strongly influences the seasonality of nutrients, dissolved oxygen, pH and water clarity.

Algal biomass as measured by chl *a* was consistently higher in the nearshore areas than the pelagic area, but the means were not significantly different. Algal biomass appears to be evenly distributed across the lake. Moreover, the significantly higher nearshore TP concentrations apparently did not result in a measurable increase in nearshore algae. The rate of exchange between the nearshore and pelagic waters was probably too great to allow a growth response to the higher nearshore TP.

While the 1994 through 2001 year-to-year variations in mean chl *a* concentrations did not relate strongly with TP, the long-term influence of TP on chl *a* and transparency becomes more convincing when the overall 10-year means are compared with model predictions and historical data. The overall 10-year mean fits closely to the predicted concentration in spite of considerable variation among the individual yearly summer concentrations. Not withstanding year-to-year variations due largely to climatic conditions, algal biomass and transparency are strongly dependent on TP concentrations in Lake Washington over a wide range of external loading. Small differences in TP are not apt to explain small year-to-year variations in chl a.

6.3. Transparency

Transparency has remained consistent from year to year, with an overall mean of 4.6 meters (15 feet) indicative of mesotrophic conditions. Mean summer transparencies (June through September) ranged from 3.5 to 5.6 m (11.5 to 18.3 ft). Except for 1999, summer mean transparencies were greater in three of the last 4 years by an average of about 1 meter than the early part of the decade, though the difference was not statistically significant. Mean transparencies in the nearshore areas were slightly less, by 0.1 to 0.5 m, than those in the pelagic area. However, that difference was not statistically significant and would be expected given that nearshore areas are closer to inflows and are subject to bottom disturbance from wind and wave action and suspended solids inputs from land runoff.

Lake Washington appears to be in stable ecological condition with respect to water quality following the pre-sewer diversion period of over-enrichment. The lake is sensitive to P loading, and the maintenance of present day water quality is dependent on P loading remaining at or near current levels.

6.4. Temperature

From 1993 to 2001 there was an increasing trend in seasonal and annual average water temperatures (epilimnetic and whole lake) that may be attributed to global climate change-related increases in air temperatures. The effect of this trend on lake biota is currently unknown. Temperature of Lake Washington ranged from 7º to 9ºC in January during the period of complete mixing every year. Similarly, the maximum temperature in both nearshore and pelagic water was between 21.5ºC and 24.5ºC. There was no significant increasing trend in maximum temperatures.

6.5. Future Directions

Lake Washington has some of the best water quality for a large lake entirely within a major metropolitan area, anywhere in the world. However recent history, where this lake was significantly culturally polluted, serves as a warning that future quality of Lake Washington is not assured without a substantial investment in time and effort. Federal listing of the chinook salmon runs in the Lake Washington watershed serves as a warning that this ecosystem remains under stress. Without a continuing commitment, the substantial investment the citizens of this region have made in protecting water resources will be lost. How these impacts are dealt with now, will determine the future quality of Lake Washington.

King County has committed substantial resources to develop a suite of tools that will assist in protecting watershed functions by identifying and correcting activities in the watershed that degrade water quality and aquatic habitat. Development of an integrated suite of predictive models and an organized database of water quality and quantity data will provide the tools used to support water resources and to ensure Lake Washington remains world famous for environmental quality.

7. GLOSSARY

Adfluvial—Spending much of the life cycle in lakes but spawning and rearing in streams.

Algae—Single-celled, non-vascular plants containing chlorophyll, often forming colonies or filamentous chains. Algae form the base of the food chain in aquatic environments.

Algal bloom—Heavy growth of algae in and on a body of water as a result of high nutrient concentrations.

Alkalinity—The acid-combining capacity of a (carbonate) solution; its buffering capacity.

Anadromous—Migrating up rivers from the sea to breed in fresh water.

Anoxic—Lacking oxygen.

Anthropogenic—Caused by humans.

Areal hypolimnetic oxygen deficit rate (**AHOD)—**A measure of the oxygen depletion rate in the hypolimnion per sediment area per day.

Biomass—The total organic matter present.

Chlorophyll—The green pigments of plants. A measurement of chlorophyll *a*, one type of pigment, is commonly used as an indicator of the algae content of water.

Cyanobacteria—Formerly known as blue-green algae, actually bacteria that exhibit characteristics similar to those of algae and are considered part of the algal community.

Epilimnion—The turbulent superficial layer of a lake lying above the metalimnion.

Escapement—The number of fish that return to a specified measuring location after all natural mortality and harvest have occurred.

Eutrophic—Having a good supply of nutrients and hence rich organic production.

Hypolimnion—The deep layer of a lake lying below the metalimnion and removed from surface influences.

Limnetic zone—The open water region of a lake. This region supports plankton and fish as the principal plants and animals.

Limiting nutrient—The essential nutrient that is most scarce in the environment relative to the needs of the organism.

Littoral zone—The shoreward region of a water body.

Mean—The average of a set of values, calculated by dividing the sum of the values by the number of values.

Mesotrophic—Waters having a nutrient load resulting in moderate productivity.

Metalimnion—The layer of water in a lake between the epilimnion and hypolimnion in which the temperature exhibits the greatest difference in a vertical direction.

Monomictic—Having one mixing and one stratification event per year. If a lake does not freeze over in the winter, the winter winds will mix the waters of the lake. In summer, the lake resists mixing and becomes stratified because the surface waters are warm (light) and the bottom waters are cold (dense).

Nutrient—Any chemical element, ion, or compound required by an organism for the continuation of growth, reproduction, or other life processes.

Oligotrophic—Characterized by low concentrations of nutrients and algae and resulting in good water transparency.

Pelagic—Occurring in or related to the deep, open water area of a lake.

pH—A measure of the acidity of water on a scale of 0 to 14, with 7 representing neutral water. A pH less than 7 is considered acidic and above 7 is basic.

Phytoplankton—Free-floating microscopic plants (algae).

Productive type—The method of spawning and rearing that produced the fish, which constitutes the stock.

Production unit—Group of fish classified by their spawning location.

Profundal zone—The deep and bottom-water area beyond the depth of effective light penetration. All of the lake floor beneath the hypolimnion.

Secchi depth—A measure of transparency of water obtained by lowering a 10-cm black-and-white disk into water until the disk is no longer visible.

Standard deviation—A measure of the spread or dispersion of a set of data.

Stock origin—The genetic history of the fish stock.

Thermal stratification—The separation of the top and bottom water layers of a lake due to temperature and densities differences.

Thermocline—The depth in a stratified lake where the greatest change in temperature occurs. The thermocline separates the epilimnion from the hypolimnion.

Trophic state—Rating of the condition of a lake on the scale of oligotrophic-mesotrophic-eutrophic (see definition of these terms).

Water column—The area of water contained between the surface and the bottom of a waterbody.

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Appendix A
Means and
Standard Deviations
of Water Quality Data

Table of Contents

Table A-1. Annual Mean Temperatures for Lake Washington, 1990-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	13.8	11.8	13.4	12.8	13.5	13.0	13.5	14.2	12.9	13.2	14.0	13.8
	S.D	5.5	4.5	4.5	5.0	5.0	4.8	4.8	6.3	4.6	4.7	4.5	5.1
807	Mean	13.5	12.2	13.7	13.0	13.3	13.2	13.6	13.2	14.0	13.6	14.7	13.7
	S.D	5.6	5.0	4.5	5.1	5.2	5.1	4.8	5.9	5.2	4.9	5.0	4.9
814	Mean	13.8	12.2	14.0	13.0	13.2	13.1	13.5	13.0	13.8	13.3	14.5	14.0
	S.D	5.6	5.1	4.5	5.1	5.1	5.1	4.9	5.6	5.0	4.8	5.0	5.1
817	Mean	-	-	-	-	13.1	13.3	14.0	13.3	14.3	13.5	14.7	13.7
	S.D	-	-	-	-	5.1	5.0	5.0	5.9	5.5	5.0	4.9	5.0
826	Mean	-	-	-	-	11.3	11.2	11.7	11.2	11.9	11.6	12.2	12.2
	S.D	-	-	-	-	3.7	3.8	4.0	4.5	3.9	3.8	4.0	4.0
829	Mean	-	-	13.9	12.2	12.6	12.6	13.1	12.1	13.6	12.9	13.3	13.7
	S.D	-	-	3.6	5.4	5.3	5.4	5.1	6.0	5.8	5.2	4.6	5.3
831	Mean	-	-	14.7	11.1	11.8	12.0	12.6	12.3	12.9	13.1	12.7	13.1
	S.D	-	-	5.2	4.5	4.0	4.2	4.1	4.8	4.3	4.1	4.1	4.3
832	Mean	13.7	12.7	15.8	13.2	13.4	13.3	14.0	13.2	14.2	13.7	14.7	14.6
	S.D	5.7	5.5	5.1	5.4	5.5	5.1	5.1	6.3	5.7	4.9	5.2	5.3
834	Mean	13.8	12.4	13.9	13.0	13.3	13.2	13.7	14.1	13.8	13.9	14.4	14.1
	S.D	5.5	5.2	4.5	5.1	5.2	5.2	5.0	6.3	5.1	4.7	5.0	5.1
840	Mean	-	-	-	-	-	12.2	12.6	12.5	13.1	12.6	12.5	13.3
	S.D	-	-	-	-	-	4.0	3.9	4.9	4.5	3.8	3.8	4.1
852	Mean	-	-	-	10.1	10.8	11.0	11.6	10.9	11.1	11.5	11.6	12.0
	S.D	-	-	-	4.0	3.8	3.8	4.3	4.3	4.0	3.9	3.7	4.1
890	Mean	-	-	-	-	-	11.1	11.6	10.9	11.8	11.8	11.8	12.0
	S.D	-	-	-	-	-	3.7	4.0	4.0	4.4	3.8	3.7	4.1
4903	Mean	-	-	-	-	-	16.5	16.9	14.4	15.1	13.5	14.1	13.8
	S.D	-	-	-	-	-	5.5	5.0	6.6	5.7	5.8	5.1	5.6

Means +/- SD are arithmetic.

Table A-2. Annual Mean Secchi Depths for Lake Washington, 1990-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	2.7	2.6	3.0	3.0	3.3	3.2	3.0	2.5	3.5	2.9	3.9	3.9
	S.D	0.7	1.4	1.0	1.2	1.2	1.0	1.1	1.2	1.2	0.9	1.4	1.4
807	Mean	3.3	3.3	3.6	3.5	3.6	3.4	2.8	2.9	3.9	3.1	4.1	3.7
	S.D	0.8	1.0	0.9	1.0	1.7	0.8	0.9	1.1	1.2	1.0	1.0	1.2
814	Mean	3.8	3.6	4.1	4.4	4.2	3.9	3.5	3.5	4.3	3.7	4.5	4.8
	S.D	1.2	0.9	1.2	1.5	1.2	1.2	1.2	0.9	1.1	0.9	1.3	1.4
817	Mean	-	-	-	-	3.8	3.9	3.5	3.2	4.2	3.5	4.3	4.3
	S.D	-	-	-	-	1.3	1.0	1.2	0.9	1.1	0.8	1.3	1.2
826	Mean	-	-	-	-	4.5	4.2	3.9	3.7	5.0	3.9	4.7	4.9
	S.D	-	-	-	-	1.3	1.2	1.1	0.9	1.1	0.8	1.3	1.8
829	Mean	-	-	4.6	4.2	3.8	3.9	3.4	3.5	4.7	3.7	4.4	4.8
	S.D	-	-	0.8	1.4	1.3	1.2	1.1	1.4	1.1	1.1	1.0	1.6
831	Mean	-	-	4.6	5.0	4.4	4.0	3.3	3.7	4.6	3.8	4.8	4.9
	S.D	-	-	1.1	2.0	1.1	1.4	1.0	1.0	1.1	1.1	1.4	1.8
832	Mean	3.2	2.8	3.9	3.4	3.7	2.9	2.7	3.1	4.0	3.3	4.3	4.2
	S.D	1.4	1.1	1.0	1.0	1.1	1.0	1.2	1.1	1.2	1.0	1.2	1.1
834	Mean	3.8	3.6	4.2	4.4	4.3	3.8	3.4	3.6	4.5	3.9	4.6	5.1
	S.D	1.5	1.0	1.2	1.4	1.3	1.0	1.2	1.1	1.0	1.1	1.3	1.8
840	Mean	-	-	-	-	-	3.5	3.3	3.5	4.4	3.6	4.4	4.6
	S.D	-	-	-	-	-	1.0	1.2	0.9	1.3	0.8	1.4	1.4
852	Mean	-	-	-	5.0	4.3	4.7	4.0	4.0	5.0	3.9	4.7	5.2
	S.D	-	-	-	1.9	1.5	1.3	1.4	0.9	0.9	0.7	1.2	1.8
890	Mean	-	-	-	-	-	4.3	3.7	4.0	5.1	3.9	4.8	5.3
	S.D	-	-	-	-	-	0.9	1.3	0.9	1.1	0.8	1.3	1.5
4903	Mean	-	-	-	-	-	-	-	-	-	-	-	-
	S.D	-	-	-	-	-	-	-	-	-	-	-	-

Means +/- SD are arithmetic.

Table A-3. Annual Dissolved Oxygen Means for Lake Washington, 1990-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	-	-	9.9	10.0	10.2	10.5	10.1	9.8	10.3	10.4	9.9	10.0
	S.D.	-	-	0.2	1.3	1.2	1.5	1.3	1.2	1.2	1.2	1.3	1.3
807	Mean	-	-	9.4	10.3	10.6	10.7	10.4	10.5	10.5	10.5	10.1	10.2
	S.D.	-	-	0.1	1.3	1.4	1.5	1.3	0.9	0.9	1.2	1.3	1.0
814	Mean	-	-	9.3	10.2	10.4	10.6	10.3	10.4	10.2	10.5	10.0	10.1
	S.D.	-	-	0.0	1.3	1.3	1.5	1.4	1.2	1.1	1.1	1.4	1.1
817	Mean	-	-	-	-	10.4	10.6	10.2	10.3	10.2	10.4	9.8	10.1
	S.D.	-	-	-	-	1.2	1.4	1.3	0.9	0.9	1.0	1.2	1.3
826	Mean	-	-	-	-	9.3	9.5	9.2	9.0	8.7	9.1	8.8	8.7
	S.D.	-	-	-	-	1.8	1.9	1.8	1.9	2.0	1.7	1.8	1.7
829	Mean	-	-	9.2	10.1	10.3	10.5	10.2	10.4	10.1	10.2	10.2	9.9
	S.D.	-	-	0.6	1.1	1.3	1.7	1.5	1.1	1.0	0.9	1.3	1.3
831	Mean	-	-	8.7	9.1	9.3	9.6	8.9	9.0	9.0	9.0	9.0	8.6
	S.D.	-	-	0.1	2.1	1.9	2.3	2.2	1.8	2.0	1.6	1.9	2.0
832	Mean	-	-	9.5	10.0	9.5	7.4	8.8	9.4	9.2	9.9	10.1	10.7
	S.D.	-	-	0.9	1.2	2.2	5.0	2.5	1.3	2.5	2.1	1.7	1.7
834	Mean	-	-	8.7	10.3	10.5	10.7	10.4	10.1	10.2	10.5	10.2	10.2
	S.D.	-	-	0.0	1.4	1.5	1.7	1.4	1.4	1.1	1.2	1.5	1.4
840	Mean	-	-	-	-	-	9.0	8.6	8.7	8.4	8.6	8.6	8.1
	S.D.	-	-	-	-	-	2.6	2.5	2.2	2.6	2.3	2.3	2.4
852	Mean	-	-	-	8.4	8.8	9.3	8.9	8.9	8.5	9.0	8.8	8.5
	S.D.	-	-	-	2.1	1.9	2.0	1.9	1.9	2.1	1.7	1.9	1.9
890	Mean	-	-	-	-	-	9.5	9.1	9.2	8.4	9.0	8.6	8.4
	S.D.	-	-	-	-	-	2.0	2.0	1.7	2.0	1.7	2.1	2.0
4903	Mean	-	-	-	-	-	11.0	10.4	11.0	10.9	10.8	10.8	10.5
	S.D.	-	-	-	-	-	1.5	1.3	0.7	0.9	1.1	1.1	1.2

Means +/- SD are arithmetic.

Table A-4. Volume-Weighted Hypolimnetic Dissolved Oxygen Means for Lake Washington, 1993-2001

YEAR	MEAN HYPOLIMENTIC DISSOLVED OXYGEN, mg/L	S.D.
1993	7.9	0.9
1994	8.8	1.6
1995	8.6	1.6
1996	8.9	1.5
1997	8.9	1.5
1998	8.8	2.3
1999	8.7	1.4
2000	8.9	2.3
2001	7.7	1.3

Means +/- SD are arithmetic.

Table A-5. Annual Conductivity Means for Lake Washington, 1992-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	-	-	102.5	104.8	107.2	108.4	103.1	97.0	103.1	104.7	102.3	101.0
	S.D	-	-	0.7	4.4	5.6	13.7	6.7	6.4	8.0	9.8	7.8	8.4
807	Mean	-	-	99.5	100.5	103.9	104.5	99.3	92.2	98.7	101.4	97.9	96.8
	S.D	-	-	0.7	3.0	3.4	13.6	4.6	3.8	5.1	9.6	5.0	6.4
814	Mean	-	-	100.0	99.7	103.3	103.3	97.8	89.4	97.2	99.2	96.5	96.1
	S.D	-	-	0.0	2.7	3.5	12.8	4.6	3.0	5.2	9.4	5.0	7.1
817	Mean	-	-	-	-	106.6	108.7	101.1	91.5	100.2	102.1	98.6	96.9
	S.D	-	-	-	-	4.0	17.9	6.3	3.4	5.6	8.7	5.7	7.5
826	Mean	-	-	-	-	102.7	103.1	96.5	88.8	96.4	99.6	93.9	95.6
	S.D	-	-	-	-	3.7	12.7	4.2	3.2	3.4	7.6	4.8	4.9
829	Mean	-	-	95.7	91.8	96.6	94.7	93.2	80.5	90.4	91.4	88.6	92.9
	S.D	-	-	2.0	7.1	6.3	13.3	5.8	8.8	8.6	12.2	7.2	6.4
831	Mean	-	-	96.8	96.1	100.2	97.6	94.6	84.9	93.7	96.2	92.2	94.2
	S.D	-	-	2.3	3.8	3.4	8.6	4.5	4.7	5.0	8.6	4.8	5.1
832	Mean	-	-	101.5	99.8	101.2	101.6	101.7	85.5	97.3	98.8	95.9	96.6
	S.D	-	-	4.9	2.7	5.5	14.0	9.2	8.8	8.8	10.2	6.9	5.9
834	Mean	-	-	98.7	98.4	101.9	101.5	96.2	87.2	95.4	97.3	94.1	96.0
	S.D	-	-	0.6	3.4	3.4	12.8	6.2	3.6	5.2	10.1	5.0	4.9
840	Mean	-	-	-	-	-	98.7	95.2	85.7	94.6	97.4	92.0	94.8
	S.D	-	-	-	-	-	9.8	4.6	4.1	4.3	8.5	5.1	4.7
852	Mean	-	-	-	99.2	102.3	104.8	95.8	88.0	95.0	98.3	93.9	95.0
	S.D	-	-	-	4.8	4.1	15.7	4.5	2.7	3.6	8.1	4.4	5.1
890	Mean	-	-	-	-	-	99.7	95.3	87.5	94.9	98.0	93.6	94.7
	S.D	-	-	-	-	-	7.2	3.5	3.0	3.7	7.6	4.2	4.8
4903	Mean	-	-	-	-	-	100.8	97.5	87.9	95.9	99.4	95.3	96.6
	S.D	-	-	-	-	-	10.0	4.2	6.6	6.6	7.3	5.1	5.5

Means +/- SD are arithmetic.

Table A-6. Annual Alkalinity Means for Lake Washington, 1990-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	39.0	39.5	37.9	38.1	41.4	40.4	39.1	36.7	38.2	36.7	37.2	39.3
	S.D.	2.9	3.9	1.8	7.3	2.5	1.4	3.0	1.9	2.2	2.2	1.4	2.2
807	Mean	36.8	36.3	37.0	38.5	39.9	39.3	37.2	36.1	37.3	35.9	36.2	38.7
	S.D.	1.9	2.1	1.4	1.9	1.6	0.7	1.2	0.8	1.5	1.5	1.2	1.3
814	Mean	-	-	-	-	40.2	39.5	36.2	35.2	37.0	35.4	36.0	38.3
	S.D.	-	-	-	-	1.5	0.9	1.5	1.1	1.6	1.7	1.2	2.0
817	Mean	-	-	-	-	40.3	39.9	37.5	35.7	38.1	36.0	37.6	38.8
	S.D.	-	-	-	-	1.6	0.8	0.9	1.3	1.8	1.7	1.0	2.0
826	Mean	-	-	-	-	38.8	38.0	35.5	34.6	36.2	34.7	35.6	37.7
	S.D.	-	-	-	-	1.3	1.1	1.7	1.1	1.4	1.6	1.1	1.2
829	Mean	-	-	39.0	36.4	37.9	36.5	34.8	31.3	34.7	33.8	34.1	37.1
	S.D.	-	-	0.0	3.5	2.9	3.2	2.0	3.4	3.5	2.5	1.7	1.7
831	Mean	-	-	35.4	35.6	39.3	37.3	34.7	33.2	34.9	33.7	34.4	37.2
	S.D.	-	-	2.2	0.7	1.8	1.5	1.6	2.1	2.3	2.0	1.6	1.3
832	Mean	36.3	35.5	36.7	38.3	40.3	40.5	39.2	34.4	37.2	35.4	38.3	38.5
	S.D.	1.7	2.4	3.1	1.7	2.1	1.3	2.5	3.3	2.2	1.5	2.8	1.8
834	Mean	35.5	35.5	37.4	36.8	39.1	38.4	35.9	34.2	36.3	34.7	35.6	37.8
	S.D.	1.7	2.6	3.7	1.8	1.6	1.0	1.7	1.7	2.0	1.8	1.4	1.4
840	Mean	-	-	-	-	-	37.8	35.2	33.2	35.6	33.7	34.7	37.5
	S.D.	-	-	-	-	-	1.3	2.3	1.8	2.1	1.9	1.5	1.2
852	Mean	-	-	-	37.0	38.5	38.0	35.2	34.4	35.9	34.9	35.4	37.4
	S.D.	-	-	-	1.3	1.4	1.1	1.5	0.9	1.4	1.2	1.0	0.8
890	Mean	-	-	-	-	-	37.6	34.6	34.0	35.3	34.4	35.0	37.3
	S.D.	-	-	-	-	-	0.9	1.4	1.5	1.4	1.4	1.1	1.0
4903	Mean	-	-	-	-	-	38.4	36.2	33.7	36.0	36.2	35.7	38.2
	S.D.	-	-	-	-	-	1.1	2.6	2.0	2.0	1.0	1.3	1.5

Means +/- SD are arithmetic.

Table A-7. Annual Total Phosphorus Means for Lake Washington, 1990-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	23	26	22	21	21	23	21	28	15	16	14	14
	+S.D.	9	20	13	23	7	14	15	15	11	6	8	8
	-S.D.	7	11	8	11	5	9	9	10	6	4	5	5
807	Mean	17	20	16	20	22	18	19	25	13	14	13	12
	+S.D.	4	7	7	21	19	12	12	13	9	7	6	6
	-S.D.	3	5	5	10	10	7	7	9	5	5	4	4
814	Mean	13	17	16	17	19	17	17	23	12	12	11	13
	+S.D.	10	8	10	21	9	13	10	24	6	5	5	9
	-S.D.	6	5	6	9	6	7	6	12	4	4	3	5
817	Mean	-	-	-	-	20	18	19	20	11	13	12	11
	+S.D.	-	-	-	-	13	16	19	11	5	5	6	5
	-S.D.	-	-	-	-	8	8	9	7	4	4	4	4
826	Mean	-	-	-	-	22	18	17	18	11	13	11	10
	+S.D.	-	-	-	-	16	13	13	10	8	8	7	6
	-S.D.	-	-	-	-	9	8	7	7	5	5	4	4
829	Mean	-	-	16	19	23	19	17	18	12	11	11	11
	+S.D.	-	-	11	18	16	20	12	12	7	5	5	6
	-S.D.	-	-	7	9	9	10	7	7	4	3	3	4
831	Mean	-	-	15	20	21	18	18	18	11	14	10	10
	+S.D.	-	-	10	14	13	15	12	9	6	9	5	4
	-S.D.	-	-	6	8	8	8	7	6	4	5	3	3
832	Mean	19	20	16	19	20	19	21	20	12	13	12	12
	+S.D.	10	10	9	12	12	11	15	10	7	4	5	7
	-S.D.	6	6	6	7	8	7	9	7	4	3	3	4
834	Mean	13	18	15	18	19	17	18	18	11	13	12	10
	+S.D.	13	6	9	23	17	11	13	8	6	6	5	5
	-S.D.	7	5	5	10	9	7	8	6	4	4	4	3
840	Mean	-	-	-	-	-	19	19	18	15	14	13	12
	+S.D.	-	-	-	-	-	13	13	9	8	6	9	6
	-S.D.	-	-	-	-	-	8	8	6	5	4	5	4
852	Mean	-	-	-	20	21	16	18	16	12	13	11	11
	+S.D.	-	-	-	24	17	15	14	12	10	8	8	5
	-S.D.	-	-	-	11	9	8	8	7	6	5	5	4
890	Mean	-	-	-	-	-	18	19	18	12	14	11	11
	+S.D.	-	-	-	-	-	15	12	11	9	7	6	5
	-S.D.	-	-	-	-	-	8	7	7	5	5	4	4
4903	Mean	-	-	-	-	-	21	21	22	12	13	13	14
	+S.D.	-	-	-	-	-	10	9	19	10	4	5	6
	-S.D.	-	-	-	-	-	7	6	10	6	3	4	4

Means +/- SD are based on log-normally distributed data.

Table A-8. Volume-Weighted Annual Whole-Lake and Nearshore Total Phosphorus Means for Lake Washington, 1990-2001

YEAR	Whole Lake Total Phosphorus Annual Mean (ug/L)	+S.D.	-S.D.	Nearshore Total Phosphorus Annual Mean (ug/L)	+S.D.	-S.D.
1990	-	-	-	20	5	4
1991	-	-	-	22	12	8
1992	14	20	9	20	10	7
1993	16	26	10	22	19	10
1994	18	25	13	24	13	9
1995	15	23	10	16	26	10
1996	16	21	13	21	11	7
1997	15	21	12	25	11	8
1998	12	17	9	14	8	5
1999	12	14	10	14	5	4
2000	10	13	8	13	6	4
2001	10	15	7	14	10	6

Means +/- SD are based on log-normally distributed data.

Table A-9. Volume-Weighted Whole-Lake Seasonal Total Phosphorus Means for Lake Washington, 1992-2001

YEAR	Winter Mean (ug/L)	+S.D.	-S.D.	Spring Mean (ug/L)	+S.D.	-S.D.	Summer Mean (ug/L)	+S.D.	-S.D.	Fall Mean (ug/L)	+S.D.	-S.D.
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-
1992	16	3	3	10	6	4	14	12	7	15	4	3
1993	16	3	3	13	4	3	20	37	13	15	0	0
1994	18	8	5	17	14	8	19	6	4	17	2	2
1995	20	3	3	16	4	3	9	2	2	19	8	6
1996	20	1	1	15	3	3	15	5	4	15	7	5
1997	20	5	4	19	5	4	12	1	1	13	2	2
1998	14	1	1	10	1	1	10	2	1	15	10	6
1999	13	1	1	11	2	2	11	1	1	14	2	2
2000	12	1	1	10	3	2	8	1	1	11	3	3
2001	10	4	3	14	10	6	8	2	2	10	1	1

Means +/- SD are based on log-normally distributed data.

Table A-10. Volume-Weighted Nearshore Seasonal Total Phosphorus Means for Lake Washington, 1990-2001

YEAR	Winter Mean (ug/L)	+S.D.	-S.D.	Spring Mean (ug/L)	+S.D.	-S.D.	Summer Mean (ug/L)	+S.D.	-S.D.	Fall Mean (ug/L)	+S.D.	-S.D.
1990	23	6	5	19	6	4	19	5	4	17	4	3
1991	36	11	9	26	6	5	20	3	3	13	5	4
1992	29	13	9	19	8	6	16	10	6	20	9	6
1993	20	22	10	21	6	5	30	45	18	18	19	9
1994	33	31	16	20	5	4	29	12	8	18	4	3
1995	33	8	6	20	5	4	5	18	4	17	13	7
1996	31	12	9	26	13	9	17	6	4	15	4	3
1997	35	12	9	32	6	5	22	3	2	16	3	2
1998	26	6	5	11	5	3	12	3	2	11	4	3
1999	21	6	5	14	1	1	12	2	1	12	6	4
2000	20	3	3	14	3	2	9	2	2	12	5	4
2001	17	8	5	24	17	10	10	2	2	9	2	1

Means +/- SD are based on log-normally distributed data.

Table A-11. Annual Soluble Reactive Phosphorus Means for Lake Washington, 1990-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	8	7	8	8	7	6	7	14	5	6	5	3
	S.D	3	4	4	5	6	6	5	7	5	4	4	1
807	Mean	8	7	6	6	6	6	5	11	5	5	4	3
	S.D	4	4	2	3	5	6	4	6	4	4	4	1
814	Mean	7	6	6	6	5	6	6	9	5	5	4	2
	S.D	4	2	2	4	5	6	5	5	5	4	4	1
817	Mean	-	-	-	-	6	6	7	10	5	6	4	3
	S.D	-	-	-	-	5	6	6	5	5	4	4	1
826	Mean	-	-	-	-	9	8	9	10	7	7	6	4
	S.D	-	-	-	-	8	7	8	5	7	6	6	4
829	Mean	-	-	7	7	5	6	7	9	5	5	4	3
	S.D	-	-	3	4	4	5	5	5	4	3	4	1
831	Mean	-	-	8	8	7	7	7	8	5	6	4	3
	S.D	-	-	6	6	5	6	6	5	4	3	3	2
832	Mean	7	7	6	6	5	5	6	9	4	5	4	2
	S.D	3	4	2	4	4	6	4	6	4	4	4	1
834	Mean	7	6	6	6	5	5	6	10	5	5	4	3
	S.D	4	2	2	4	5	5	5	6	4	4	4	1
840	Mean	-	-	-	-	0	6	8	9	5	6	5	4
	S.D	-	-	-	-	0	5	6	5	4	4	4	3
852	Mean	-	-	-	9	10	9	11	10	9	9	7	5
	S.D	-	-	-	8	17	8	9	7	8	7	7	5
890	Mean	-	-	-	-	-	9	10	10	8	9	6	5
	S.D	-	-	-	-	-	7	7	6	7	5	5	5
4903	Mean	-	-	-	-	-	6	7	10	5	6	4	4
	S.D	-	-	-	-	-	5	4	5	5	4	4	2

Means +/- SD are arithmetic.

Table A-12. Volume-Weighted Annual Whole-Lake and Nearshore Soluble Reactive Phosphorus Means for Lake Washington, 1990-2001

YEAR	Whole Lake Soluble Reactive Phosphorus Annual Mean (ug/L)	+S.D.	-S.D.	Nearshore Soluble Reactive Phosphorus Annual Mean (ug/L)	+S.D.	-S.D.
1990	-	-	-	7	4	4
1991	-	-	-	7	2	2
1992	6	3	3	7	4	4
1993	6	3	3	7	4	4
1994	7	3	3	6	5	4
1995	7	3	3	6	6	4
1996	7	2	2	7	4	4
1997	8	3	3	11	5	5
1998	6	3	3	4	5	2
1999	6	2	2	5	4	3
2000	5	2	2	5	4	3
2001	3	2	1	2	1	0

Means +/- SD are arithmetic.

Table A-13. Volume-Weighted Whole-Lake Soluble Reactive Phosphorus Seasonal Means for Lake Washington, 1992-2001

YEAR	Winter Mean (ug/L)	+S.D.	-S.D.	Spring Mean (ug/L)	+S.D.	-S.D.	Summer Mean (ug/L)	+S.D.	-S.D.	Fall Mean (ug/L)	+S.D.	-S.D.
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-
1992	6	3	3	5	3	3	6	5	4	8	2	2
1993	8	3	3	3	1	1	5	1	1	9	1	1
1994	10	1	1	4	2	2	8	4	4	7	3	3
1995	10	2	2	4	1	1	6	1	1	8	2	2
1996	9	0	0	5	0	0	7	1	1	8	1	1
1997	12	1	1	7	4	4	5	1	1	7	1	1
1998	8	3	3	3	0	0	5	1	1	8	2	2
1999	8	0	0	5	1	1	5	1	1	8	1	1
2000	8	1	1	3	1	1	4	1	1	5	1	1
2001	2	2	0	1	1	0	4	2	2	6	1	1

Means +/- SD are arithmetic.

Table A-14. Annual Total Nitrogen Means for Lake Washington, 1993-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	-	-	-	356	360	413	430	467	363	465	409	318
	S.D	-	-	-	154	180	202	215	195	121	183	188	147
807	Mean	-	-	-	294	329	321	350	390	318	387	340	269
	S.D	-	-	-	123	174	102	103	130	103	119	90	80
814	Mean	-	-	-	245	288	290	349	363	293	365	327	279
	S.D	-	-	-	49	139	92	121	111	77	89	93	112
817	Mean	-	-	-	-	329	359	400	380	340	383	348	273
	S.D	-	-	-	-	118	186	211	109	109	101	107	74
826	Mean	-	-	-	-	337	346	378	393	346	408	379	285
	S.D	-	-	-	-	138	90	94	103	67	69	86	62
829	Mean	-	-	-	286	310	304	330	366	279	362	321	274
	S.D	-	-	-	74	116	120	80	79	70	88	88	77
831	Mean	-	-	-	301	322	316	352	391	320	393	346	282
	S.D	-	-	-	60	90	86	77	215	81	65	85	70
832	Mean	-	-	-	271	297	321	351	345	356	357	332	270
	S.D	-	-	-	55	95	133	111	92	198	88	98	69
834	Mean	-	-	-	243	336	292	326	336	278	347	314	261
	S.D	-	-	-	43	237	95	83	91	65	77	86	84
840	Mean	-	-	-	-	-	323	364	358	336	402	368	291
	S.D	-	-	-	-	-	93	83	82	81	74	77	57
852	Mean	-	-	-	-	334	338	369	380	346	408	374	291
	S.D	-	-	-	-	93	82	75	82	66	70	88	56
890	Mean	-	-	-	-	-	332	372	372	345	412	373	293
	S.D	-	-	-	-	-	85	72	89	78	68	85	60
4903	Mean	-	-	-	-	-	300	347	369	316	374	332	298
	S.D	-	-	-	-	-	108	70	77	86	90	112	81

Means +/- SD are arithmetic.

Table A-15. Volume-Weighted Annual Whole-Lake and Nearshore Total Nitrogen Means for Lake Washington, 1993-2001

YEAR	Whole Lake Total Nitrogen Annual Mean (ug/L)	S.D.	Nearshore Total Nitrogen Annual Mean (ug/L)	S.D.
1990	-	-	-	-
1991	-	-	-	-
1992	-	-	-	-
1993	173	21	275	46
1994	252	37	304	100
1995	279	27	326	136
1996	302	20	372	120
1997	316	35	387	110
1998	290	33	322	86
1999	336	20	390	109
2000	320	45	357	105
2001	235	25	278	89

Means +/- SD are arithmetic.

Table A-16. Volume-Weighted Annual Whole-Lake Total Nitrogen Seasonal Means for Lake Washington, 1993-2001

YEAR	Winter Mean (ug/L)	S.D.	Spring Mean (ug/L)	S.D.	Summer Mean (ug/L)	S.D.	Fall Mean (ug/L)	S.D.
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
1993	-	-	189	15	153	19	178	9
1994	223	40	273	58	260	15	253	23
1995	298	11	290	42	265	13	262	23
1996	304	17	319	27	299	10	287	16
1997	328	7	337	53	322	23	276	11
1998	258	17	297	10	292	16	311	55
1999	317	27	349	17	337	16	341	12
2000	325	16	311	28	308	28	334	94
2001	241	3	230	28	218	21	252	32

Means +/- SD are arithmetic.

Table A-17. Annual Ammonium Means for Lake Washington, 1990-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	15.7	16.7	19.4	15.2	20.0	22.2	26.4	33.8	20.6	15.7	14.4	13.0
	S.D	8.7	8.8	8.8	11.9	0.0	6.0	7.7	12.2	5.9	9.7	4.9	5.0
807	Mean	12.7	12.9	13.5	12.3	20.0	20.4	24.0	28.6	16.3	10.7	12.3	10.2
	S.D	5.6	3.2	4.3	7.6	0.0	1.8	5.7	12.1	5.0	2.0	3.9	0.7
814	Mean	12.8	11.1	11.9	11.1	20.0	20.0	25.8	26.1	16.3	11.5	11.6	10.6
	S.D	5.9	1.9	3.0	6.3	0.0	0.0	7.3	5.6	4.7	5.6	3.2	1.6
817	Mean	-	-	-	-	21.7	20.6	26.5	27.5	18.7	14.7	12.0	11.3
	S.D	-	-	-	-	8.9	2.6	10.1	8.7	10.3	8.6	2.8	1.3
826	Mean	-	-	-	-	21.0	22.1	26.6	27.7	16.0	12.6	13.0	12.1
	S.D	-	-	-	-	5.4	11.0	10.0	11.1	5.5	7.4	6.0	3.2
829	Mean	-	-	13.3	12.3	20.1	22.1	24.1	27.7	15.6	12.2	12.1	10.5
	S.D	-	-	5.7	5.7	0.4	8.0	4.8	8.1	4.7	3.4	4.4	1.1
831	Mean	-	-	15.6	11.4	20.6	20.3	24.2	31.2	15.8	14.0	12.1	11.4
	S.D	-	-	10.4	4.7	3.3	1.3	5.8	32.3	4.7	6.4	3.8	5.2
832	Mean	11.6	10.9	12.5	13.7	20.0	20.0	23.6	27.1	16.2	11.3	12.4	11.0
	S.D	4.4	1.8	4.9	10.6	0.0	0.0	6.0	6.2	4.7	2.1	6.5	2.6
834	Mean	12.9	11.5	12.9	10.8	20.2	21.0	25.0	28.4	18.0	10.8	12.5	10.8
	S.D	7.1	2.5	6.1	4.6	1.1	3.9	7.4	7.6	12.1	2.0	4.0	2.7
840	Mean	-	-	-	-	-	20.4	26.1	31.9	17.5	12.8	14.3	12.7
	S.D	-	-	-	-	-	1.8	13.2	9.8	8.0	6.8	10.8	5.7
852	Mean	-	-	-	7.8	26.0	20.2	24.2	24.4	14.4	11.5	12.1	11.3
	S.D	-	-	-	2.5	28.8	1.3	6.7	6.3	5.2	4.1	5.2	3.5
890	Mean	-	-	-	-	-	20.6	23.8	26.5	15.1	11.9	12.4	11.1
	S.D	-	-	-	-	-	3.2	7.5	9.0	5.1	4.3	5.8	3.8
4903	Mean	-	-	-	-	-	40.2	27.0	30.1	11.7	19.9	13.5	22.1
	S.D	-	-	-	-	-	0.0	5.8	6.7	1.5	10.8	1.3	2.1

Means +/- SD are arithmetic.

Table A-18. Volume-Weighted Annual Whole-Lake and Nearshore Ammonium Means for Lake Washington, 1990-2001

YEAR	Whole Lake Ammonium Annual Mean (ug/L)	S.D.	Nearshore Ammonium Annual Mean (ug/L)	S.D.
1990	-	-	13.2	4.5
1991	-	-	12.9	2.6
1992	11.4	5.3	17.8	6.9
1993	4.2	2.0	12.4	3.9
1994	18.7	11.8	20.2	0.7
1995	17.2	1.9	21.4	2.2
1996	19.6	4.3	25.0	4.6
1997	21.9	4.8	28.8	5.8
1998	13.1	2.9	17.6	4.7
1999	10.0	2.7	12.6	3.2
2000	10.0	2.9	12.6	3.6
2001	9.0	1.3	11.1	1.0

Means +/- SD are arithmetic.

Table A-19. Annual Nitrate-Nitrogen Means for Lake Washington, 1990-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	209	340	214	159	151	172	191	258	190	241	183	121
	S.D	188	323	249	124	162	166	125	202	132	177	177	129
807	Mean	121	177	124	107	101	108	136	187	148	180	136	94
	S.D	99	126	102	149	67	84	83	125	108	129	116	83
814	Mean	121	155	106	83	93	102	132	163	137	172	128	89
	S.D	105	100	71	64	61	70	76	107	88	115	108	71
817	Mean	-	-	-	-	122	138	162	184	164	185	147	88
	S.D	-	-	-	-	87	148	108	126	112	127	119	75
826	Mean	-	-	-	-	150	166	210	238	213	246	217	133
	S.D	-	-	-	-	77	82	93	101	87	99	106	76
829	Mean	-	-	104	152	139	146	157	197	150	203	154	120
	S.D	-	-	44	196	91	113	88	98	105	126	102	78
831	Mean	-	-	167	146	151	139	202	212	184	231	184	136
	S.D	-	-	87	77	75	82	90	97	100	105	95	72
832	Mean	129	169	119	86	109	121	145	166	138	173	139	98
	S.D	103	124	82	62	77	101	91	111	99	122	121	81
834	Mean	109	156	106	77	94	98	124	160	128	163	130	89
	S.D	97	103	71	62	59	67	73	102	85	111	107	72
840	Mean	-	-	-	-	-	135	197	201	188	236	197	135
	S.D	-	-	-	-	-	83	89	97	97	97	88	63
852	Mean	-	-	-	187	163	175	219	246	212	252	221	147
	S.D	-	-	-	176	76	84	91	101	85	101	103	74
890	Mean	-	-	-	-	-	162	217	247	211	261	217	155
	S.D	-	-	-	-	-	80	92	96	92	98	98	69
4903	Mean	-	-	-	-	-	-	-	-	-	-	-	-
	S.D	-	-	-	-	-	-	-	-	-	-	-	-

Means +/- SD are arithmetic.

Table A-20. Volume-Weighted Annual Whole-Lake Nitrate-Nitrogen Seasonal Means for Lake Washington, 1992-2001

YEAR	Winter Mean (ug/L)	+S.D.	-S.D.	Spring Mean (ug/L)	+S.D.	-S.D.	Summer Mean (ug/L)	+S.D.	-S.D.	Fall Mean (ug/L)	+S.D.	-S.D.
1990	-	-		-	-		-	-		-	-	
1991	-	-		-	-		-	-		-	-	
1992	198	29	29	95	47	47	66	56	46	129	15	15
1993	243	173	173	86	17	17	107	16	16	144	22	22
1994	155	14	14	111	25	25	114	17	17	124	3	3
1995	161	7	7	132	17	17	136	5	5	137	24	24
1996	189	23	23	177	2	2	168	10	10	197	34	34
1997	232	15	15	206	52	52	179	15	15	181	7	7
1998	183	11	11	177	10	10	176	13	13	187	31	31
1999	214	23	23	226	30	30	198	20	20	211	21	21
2000	219	7	7	178	33	33	186	1	1	159	17	17
2001	131	3	3	102	5	5	114	13	13	138	17	17

Means +/- SD are arithmetic.

Table A-21. Volume-Weighted Annual Nearshore Nitrate-Nitrogen Seasonal Means for Lake Washington, 1990-2001

YEAR	Winter Mean (ug/L)	+S.D.	-S.D.	Spring Mean (ug/L)	+S.D.	-S.D.	Summer Mean (ug/L)	+S.D.	-S.D.	Fall Mean (ug/L)	+S.D.	-S.D.
1990	290	43	43	79	58	58	50	0	0	66	23	23
1991	378	96	96	178	115	115	63	23	23	94	55	55
1992	424	243	243	83	25	25	52	3	3	108	40	40
1993	204	9	9	99	29	29	36	18	16	61	78	41
1994	233	23	23	80	39	39	50	0	0	87	55	55
1995	301	81	81	69	31	31	51	2	2	113	96	93
1996	284	33	33	171	21	21	68	22	22	88	53	53
1997	351	61	61	234	109	109	59	15	15	139	75	75
1998	289	11	11	186	25	25	59	49	39	72	71	52
1999	349	47	47	235	73	73	54	47	34	142	122	122
2000	326	25	25	146	90	90	42	34	22	108	50	50
2001	192	5	5	99	56	56	20	1	0	117	117	97

Means +/- SD are arithmetic.

Table A-22. Annual Total Nitrogen-Total Phosphorus Ratio Means for Lake Washington, 1993-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	-	-	-	19	16	17	22	16	27	28	27	23
	S.D	-	-	-	12	5	5	14	4	19	4	7	7
807	Mean	-	-	-	16	18	19	19	16	25	27	25	23
	S.D	-	-	-	10	19	8	11	5	12	6	7	7
814	Mean	-	-	-	18	16	18	22	18	26	29	29	23
	S.D	-	-	-	10	7	9	13	8	12	7	5	7
817	Mean	-	-	-	-	17	20	21	20	31	29	30	25
	S.D	-	-	-	-	6	8	8	7	15	5	8	6
826	Mean	-	-	-	-	17	20	26	23	34	34	35	29
	S.D	-	-	-	-	12	11	17	10	18	16	17	11
829	Mean	-	-	-	16	14	16	21	22	24	31	29	25
	S.D	-	-	-	8	7	9	10	12	7	8	6	7
831	Mean	-	-	-	16	16	19	21	24	30	31	33	29
	S.D	-	-	-	8	7	10	13	18	14	13	11	7
832	Mean	-	-	-	16	16	16	17	18	29	26	27	26
	S.D	-	-	-	6	7	4	6	9	12	4	4	7
834	Mean	-	-	-	18	19	18	20	19	27	27	27	27
	S.D	-	-	-	9	15	8	12	7	12	8	7	10
840	Mean	-	-	-	-	-	18	21	20	23	29	30	25
	S.D	-	-	-	-	-	8	12	8	9	8	12	8
852	Mean	-	-	-	-	17	25	23	26	33	33	35	28
	S.D	-	-	-	-	8	16	13	14	20	14	16	9
890	Mean	-	-	-	-	-	21	22	21	31	32	34	28
	S.D	-	-	-	-	-	12	12	9	17	12	13	8
4903	Mean	-	-	-	-	-	-	-	-	-	-	-	-
	S.D	-	-	-	-	-	-	-	-	-	-	-	-

Means +/- SD are arithmetic.

Table A-23. Volume-Weighted Annual Total Nitrogen-Total Phosphorus Whole-Lake and Epilimnion Means for Lake Washington, 1993-2001

YEAR	Whole Lake TN:TP Annual Mean	Epilimnion TN:TP Annual Mean
1990	-	-
1991	-	-
1992	-	-
1993	9	7
1994	13	13
1995	17	17
1996	18	19
1997	20	19
1998	23	27
1999	27	29
2000	30	34
2001	21	21

Means +/- SD are arithmetic.

Table A-24. Annual Chlorophyll *a* Means for Lake Washington, 1990-2001

Station		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
804	Mean	2.7	3.5	3.4	2.6	4.4	5.1	4.0	4.3	4.3	4.1	4.2	5.4
	+S.D.	2.9	3.2	2.9	4.2	14.3	7.3	4.9	4.6	2.9	4.1	7.0	7.3
	-S.D.	1.4	1.7	1.6	1.6	3.3	3.0	2.2	2.2	1.7	2.1	2.6	3.1
807	Mean	2.1	3.2	3.1	2.1	4.9	6.0	4.7	5.2	4.0	4.4	3.5	4.6
	+S.D.	5.9	2.4	3.4	10.7	7.5	8.2	5.9	5.5	2.8	4.5	3.9	4.8
	-S.D.	1.6	1.4	1.6	1.7	3.0	3.5	2.6	2.7	1.7	2.2	1.9	2.4
814	Mean	2.0	3.0	3.2	1.4	3.6	4.8	2.7	4.5	3.5	3.4	4.2	4.2
	+S.D.	11.2	3.4	4.6	10.9	6.4	7.9	13.4	4.5	2.1	3.9	4.5	3.9
	-S.D.	1.7	1.6	1.9	1.2	2.3	3.0	2.3	2.2	1.3	1.8	2.2	2.0
817	Mean	-	-	-	-	3.6	5.2	3.5	4.3	3.7	3.4	4.4	4.9
	+S.D.	-	-	-	-	11.3	8.8	4.6	4.0	3.8	3.5	5.4	6.6
	-S.D.	-	-	-	-	2.7	3.3	2.0	2.1	1.9	1.7	2.4	2.8
826	Mean	-	-	-	-	2.5	4.2	2.9	3.9	3.2	3.2	3.5	3.6
	+S.D.	-	-	-	-	8.3	7.3	4.1	4.2	2.7	3.7	4.7	6.8
	-S.D.	-	-	-	-	1.9	2.7	1.7	2.0	1.5	1.7	2.0	2.4
829	Mean	-	-	1.8	1.6	3.4	3.1	2.5	3.5	3.5	2.6	4.0	3.4
	+S.D.	-	-	1.6	5.1	6.4	4.1	3.0	3.4	1.7	2.5	3.6	3.2
	-S.D.	-	-	0.8	1.2	2.2	1.8	1.4	1.7	1.2	1.3	1.9	1.7
831	Mean	-	-	2.4	2.3	3.4	4.1	3.0	3.7	3.4	2.7	4.1	3.6
	+S.D.	-	-	1.1	1.8	1.9	2.4	1.6	1.9	1.5	1.4	2.2	1.9
	-S.D.	-	-	1.9	9.4	4.0	6.0	3.2	4.1	2.5	3.1	4.9	4.0
832	Mean	1.7	3.3	2.0	1.0	4.3	5.5	4.1	3.8	4.2	3.6	4.2	4.4
	+S.D.	8.2	4.0	9.0	13.8	5.4	8.1	4.6	3.0	3.4	3.8	3.5	3.6
	-S.D.	1.4	1.8	1.7	1.0	2.4	3.3	2.2	1.7	1.9	1.9	1.9	2.0
834	Mean	1.7	3.1	3.1	2.5	3.9	5.2	3.8	3.9	3.6	3.6	4.3	4.0
	+S.D.	10.0	3.2	3.5	6.2	6.3	7.8	4.9	4.1	2.8	3.5	3.7	4.1
	-S.D.	1.4	1.6	1.6	1.8	2.4	3.1	2.1	2.0	1.6	1.8	2.0	2.0
840	Mean	-	-	-	-	-	5.5	3.3	3.9	4.2	3.6	4.3	4.3
	+S.D.	-	-	-	-	-	10.1	3.1	4.1	3.4	3.5	4.7	4.2
	-S.D.	-	-	-	-	-	3.6	1.6	2.0	1.9	1.8	2.3	2.1
852	Mean	-	-	-	0.2	1.3	1.5	1.5	1.8	1.1	1.4	1.6	1.6
	+S.D.	-	-	-	2.1	4.3	5.1	3.3	4.9	2.7	2.7	4.7	4.1
	-S.D.	-	-	-	0.2	1.0	1.1	1.0	1.3	0.8	0.9	1.2	1.1
890	Mean	-	-	-	-	-	3.8	2.5	3.2	2.8	3.0	3.9	3.4
	+S.D.	-	-	-	-	-	5.1	2.6	4.3	3.1	3.5	5.6	4.0
	-S.D.	-	-	-	-	-	2.2	1.3	1.9	1.5	1.6	2.3	1.8
4903	Mean	-	-	-	-	-	4.4	3.0	3.5	3.5	2.9	4.6	3.8
	+S.D.	-	-	-	-	-	5.4	2.2	4.5	3.1	2.3	5.3	2.8
	-S.D.	-	-	-	-	-	2.4	1.3	2.0	1.6	1.3	2.5	1.6

Means +/- SD are arithmetic.

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0560	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0804	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0807	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0814	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0817	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0826	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0829	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0831	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0832	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0834	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0840	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0852	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0890	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
4903	1,1,1-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0560	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0804	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0807	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0814	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0817	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0826	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0829	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0831	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0832	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0834	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0840	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0852	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0890	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
4903	1,1,2,2-Tetrachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0560	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0804	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0807	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0814	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0817	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0826	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0829	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0831	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0832	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0834	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0840	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0852	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0890	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
4903	1,1,2-Trichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0560	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0804	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0807	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0814	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0817	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0826	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0829	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0831	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0832	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0834	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0840	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0852	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0890	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
4903	1,1,2-Trichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0560	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0804	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0807	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0814	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0817	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0826	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0829	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0831	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0832	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0834	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0840	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0852	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0890	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
4903	1,1-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0560	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0804	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0807	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0814	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0817	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0826	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0829	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0831	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0832	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0834	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0840	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0852	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0890	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
4903	1,1-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0560	1,2,4-Trichlorobenzene	ug/L	0.29	-	0.29	0.29	1	0
0804	1,2,4-Trichlorobenzene	ug/L	0.285	-	0.285	0.285	1	0
0807	1,2,4-Trichlorobenzene	ug/L	0.022	0.075	0.0024	0.305	16	0
0814	1,2,4-Trichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0817	1,2,4-Trichlorobenzene	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	1,2,4-Trichlorobenzene	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	1,2,4-Trichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0831	1,2,4-Trichlorobenzene	ug/L	0.020	0.068	0.0024	0.285	17	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0832	1,2,4-Trichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0834	1,2,4-Trichlorobenzene	ug/L	0.021	0.073	0.0024	0.305	17	0
0840	1,2,4-Trichlorobenzene	ug/L	0.022	0.072	0.0024	0.29	16	0
0852	1,2,4-Trichlorobenzene	ug/L	0.022	0.073	0.0024	0.285	15	0
0890	1,2,4-Trichlorobenzene	ug/L	0.022	0.074	0.0024	0.3	16	0
4903	1,2,4-Trichlorobenzene	ug/L	0.098	0.17	0.0024	0.29	3	0
0560	1,2-Dichlorobenzene	ug/L	0.29	-	0.29	0.29	1	0
0804	1,2-Dichlorobenzene	ug/L	0.285	-	0.285	0.285	1	0
0807	1,2-Dichlorobenzene	ug/L	0.033	0.073	0.01	0.305	16	0
0814	1,2-Dichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0817	1,2-Dichlorobenzene	ug/L	0.032	0.068	0.01	0.285	16	0
0826	1,2-Dichlorobenzene	ug/L	0.033	0.069	0.01	0.29	16	0
0829	1,2-Dichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0831	1,2-Dichlorobenzene	ug/L	0.032	0.065	0.01	0.285	17	0
0832	1,2-Dichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0834	1,2-Dichlorobenzene	ug/L	0.033	0.070	0.01	0.305	17	0
0840	1,2-Dichlorobenzene	ug/L	0.033	0.069	0.01	0.29	16	0
0852	1,2-Dichlorobenzene	ug/L	0.034	0.070	0.01	0.285	15	0
0890	1,2-Dichlorobenzene	ug/L	0.033	0.071	0.01	0.3	16	0
4903	1,2-Dichlorobenzene	ug/L	0.10	0.16	0.01	0.29	3	0
0560	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0804	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0807	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0814	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0817	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0826	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0829	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0831	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0832	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0834	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0840	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0852	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0890	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
4903	1,2-Dichloroethane	ug/L	0.5	-	0.5	0.5	1	0
0560	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0804	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0807	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0814	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0817	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0826	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0829	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0831	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0832	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0834	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0840	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0852	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0890	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
4903	1,2-Dichloropropane	ug/L	0.5	-	0.5	0.5	1	0
0560	1,2-Diphenylhydrazine	ug/L	0.95	-	0.95	0.95	1	0
0804	1,2-Diphenylhydrazine	ug/L	0.95	-	0.95	0.95	1	0
0807	1,2-Diphenylhydrazine	ug/L	1	-	1	1	1	0
0814	1,2-Diphenylhydrazine	ug/L	1	-	1	1	1	0
0817	1,2-Diphenylhydrazine	ug/L	0.95	-	0.95	0.95	1	0
0826	1,2-Diphenylhydrazine	ug/L	0.95	-	0.95	0.95	1	0
0829	1,2-Diphenylhydrazine	ug/L	1	-	1	1	1	0
0831	1,2-Diphenylhydrazine	ug/L	0.95	-	0.95	0.95	1	0
0832	1,2-Diphenylhydrazine	ug/L	1	-	1	1	1	0
0834	1,2-Diphenylhydrazine	ug/L	1	-	1	1	1	0
0840	1,2-Diphenylhydrazine	ug/L	0.95	-	0.95	0.95	1	0
0852	1,2-Diphenylhydrazine	ug/L	0.95	-	0.95	0.95	1	0
0890	1,2-Diphenylhydrazine	ug/L	1	-	1	1	1	0
4903	1,2-Diphenylhydrazine	ug/L	0.95	-	0.95	0.95	1	0
0560	1,3-Dichlorobenzene	ug/L	0.29	-	0.29	0.29	1	0
0804	1,3-Dichlorobenzene	ug/L	0.285	-	0.285	0.285	1	0
0807	1,3-Dichlorobenzene	ug/L	0.033	0.073	0.01	0.305	16	0
0814	1,3-Dichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0817	1,3-Dichlorobenzene	ug/L	0.032	0.068	0.01	0.285	16	0
0826	1,3-Dichlorobenzene	ug/L	0.033	0.069	0.01	0.29	16	0
0829	1,3-Dichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0831	1,3-Dichlorobenzene	ug/L	0.032	0.065	0.01	0.285	17	0
0832	1,3-Dichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0834	1,3-Dichlorobenzene	ug/L	0.033	0.070	0.01	0.305	17	0
0840	1,3-Dichlorobenzene	ug/L	0.033	0.069	0.01	0.29	16	0
0852	1,3-Dichlorobenzene	ug/L	0.034	0.070	0.01	0.285	15	0
0890	1,3-Dichlorobenzene	ug/L	0.033	0.071	0.01	0.3	16	0
4903	1,3-Dichlorobenzene	ug/L	0.10	0.16	0.01	0.29	3	0
0560	1,4-Dichlorobenzene	ug/L	0.29	-	0.29	0.29	1	0
0804	1,4-Dichlorobenzene	ug/L	0.285	-	0.285	0.285	1	0
0807	1,4-Dichlorobenzene	ug/L	0.033	0.073	0.01	0.305	16	0
0814	1,4-Dichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0817	1,4-Dichlorobenzene	ug/L	0.032	0.068	0.01	0.285	16	0
0826	1,4-Dichlorobenzene	ug/L	0.033	0.069	0.01	0.29	16	0
0829	1,4-Dichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0831	1,4-Dichlorobenzene	ug/L	0.032	0.065	0.01	0.285	17	0
0832	1,4-Dichlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0834	1,4-Dichlorobenzene	ug/L	0.033	0.070	0.01	0.305	17	0
0840	1,4-Dichlorobenzene	ug/L	0.033	0.069	0.01	0.29	16	0
0852	1,4-Dichlorobenzene	ug/L	0.034	0.070	0.01	0.285	15	0
0890	1,4-Dichlorobenzene	ug/L	0.033	0.071	0.01	0.3	16	0
4903	1,4-Dichlorobenzene	ug/L	0.10	0.16	0.01	0.29	3	0
0560	2,4,5-T	ug/L	0.135	-	0.135	0.135	1	0
0804	2,4,5-T	ug/L	0.125	-	0.125	0.125	1	0
0807	2,4,5-T	ug/L	0.038	0.026	0.025	0.13	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0814	2,4,5-T	ug/L	0.13	-	0.13	0.13	1	0
0817	2,4,5-T	ug/L	0.038	0.026	0.025	0.13	16	0
0826	2,4,5-T	ug/L	0.037	0.025	0.025	0.125	16	0
0829	2,4,5-T	ug/L	0.125	-	0.125	0.125	1	0
0831	2,4,5-T	ug/L	0.037	0.025	0.025	0.13	17	0
0832	2,4,5-T	ug/L	0.13	-	0.13	0.13	1	0
0834	2,4,5-T	ug/L	0.037	0.024	0.025	0.125	17	0
0840	2,4,5-T	ug/L	0.037	0.026	0.025	0.13	16	0
0852	2,4,5-T	ug/L	0.038	0.025	0.025	0.125	15	0
0890	2,4,5-T	ug/L	0.036	0.026	0.0035	0.125	16	0
4903	2,4,5-T	ug/L	0.068	0.049	0.04	0.125	3	0
0560	2,4,5-TP (Silvex)	ug/L	0.165	-	0.165	0.165	1	0
0804	2,4,5-TP (Silvex)	ug/L	0.155	-	0.155	0.155	1	0
0807	2,4,5-TP (Silvex)	ug/L	0.046	0.043	0.01	0.16	16	0
0814	2,4,5-TP (Silvex)	ug/L	0.155	-	0.155	0.155	1	0
0817	2,4,5-TP (Silvex)	ug/L	0.045	0.042	0.01	0.155	16	0
0826	2,4,5-TP (Silvex)	ug/L	0.042	0.042	0.01	0.155	16	0
0829	2,4,5-TP (Silvex)	ug/L	0.155	-	0.155	0.155	1	0
0831	2,4,5-TP (Silvex)	ug/L	0.043	0.041	0.01	0.155	17	0
0832	2,4,5-TP (Silvex)	ug/L	0.16	-	0.16	0.16	1	0
0834	2,4,5-TP (Silvex)	ug/L	0.043	0.041	0.01	0.155	17	0
0840	2,4,5-TP (Silvex)	ug/L	0.042	0.043	0.01	0.16	16	0
0852	2,4,5-TP (Silvex)	ug/L	0.044	0.043	0.01	0.155	15	0
0890	2,4,5-TP (Silvex)	ug/L	0.045	0.042	0.0014	0.155	16	0
4903	2,4,5-TP (Silvex)	ug/L	0.098	0.049	0.07	0.155	3	0
0560	2,4,5-Trichlorophenol	ug/L	1.95	-	1.95	1.95	1	0
0804	2,4,5-Trichlorophenol	ug/L	1.9	-	1.9	1.9	1	0
0807	2,4,5-Trichlorophenol	ug/L	0.17	0.50	0.025	2.05	16	0
0814	2,4,5-Trichlorophenol	ug/L	2	-	2	2	1	0
0817	2,4,5-Trichlorophenol	ug/L	0.16	0.46	0.025	1.9	16	0
0826	2,4,5-Trichlorophenol	ug/L	0.17	0.48	0.025	1.95	16	0
0829	2,4,5-Trichlorophenol	ug/L	2	-	2	2	1	0
0831	2,4,5-Trichlorophenol	ug/L	0.16	0.45	0.025	1.9	17	0
0832	2,4,5-Trichlorophenol	ug/L	2	-	2	2	1	0
0834	2,4,5-Trichlorophenol	ug/L	0.16	0.49	0.025	2.05	17	0
0840	2,4,5-Trichlorophenol	ug/L	0.17	0.48	0.03	1.95	16	0
0852	2,4,5-Trichlorophenol	ug/L	0.17	0.48	0.025	1.9	15	0
0890	2,4,5-Trichlorophenol	ug/L	0.17	0.49	0.025	2	16	0
4903	2,4,5-Trichlorophenol	ug/L	0.67	1.1	0.025	1.95	3	0
0560	2,4,6-Trichlorophenol	ug/L	1.95	-	1.95	1.95	1	0
0804	2,4,6-Trichlorophenol	ug/L	1.9	-	1.9	1.9	1	0
0807	2,4,6-Trichlorophenol	ug/L	0.14	0.51	0.01	2.05	16	0
0814	2,4,6-Trichlorophenol	ug/L	2	-	2	2	1	0
0817	2,4,6-Trichlorophenol	ug/L	0.13	0.47	0.01	1.9	16	0
0826	2,4,6-Trichlorophenol	ug/L	0.14	0.48	0.01	1.95	16	0
0829	2,4,6-Trichlorophenol	ug/L	2	-	2	2	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0831	2,4,6-Trichlorophenol	ug/L	0.13	0.46	0.01	1.9	17	0
0832	2,4,6-Trichlorophenol	ug/L	2	-	2	2	1	0
0834	2,4,6-Trichlorophenol	ug/L	0.14	0.49	0.01	2.05	17	0
0840	2,4,6-Trichlorophenol	ug/L	0.14	0.48	0.01	1.95	16	0
0852	2,4,6-Trichlorophenol	ug/L	0.14	0.49	0.01	1.9	15	0
0890	2,4,6-Trichlorophenol	ug/L	0.14	0.50	0.01	2	16	0
4903	2,4,6-Trichlorophenol	ug/L	0.66	1.1	0.01	1.95	3	0
0560	2,4-D	ug/L	0.105	-	0.105	0.105	1	0
0804	2,4-D	ug/L	0.1	-	0.1	0.1	1	0
0807	2,4-D	ug/L	0.032	0.023	0.015	0.105	16	0
0814	2,4-D	ug/L	0.1	-	0.1	0.1	1	0
0817	2,4-D	ug/L	0.035	0.025	0.015	0.1	16	1
0826	2,4-D	ug/L	0.030	0.022	0.015	0.1	16	0
0829	2,4-D	ug/L	0.1	-	0.1	0.1	1	0
0831	2,4-D	ug/L	0.030	0.022	0.015	0.1	17	0
0832	2,4-D	ug/L	0.105	-	0.105	0.105	1	0
0834	2,4-D	ug/L	0.030	0.022	0.015	0.1	17	0
0840	2,4-D	ug/L	0.037	0.033	0.015	0.13	16	1
0852	2,4-D	ug/L	0.031	0.023	0.015	0.1	15	0
0890	2,4-D	ug/L	0.030	0.023	0.0018	0.1	16	0
4903	2,4-D	ug/L	0.060	0.035	0.04	0.1	3	0
0560	2,4-DB	ug/L	0.145	-	0.145	0.145	1	0
0804	2,4-DB	ug/L	0.135	-	0.135	0.135	1	0
0807	2,4-DB	ug/L	0.045	0.029	0.025	0.14	16	0
0814	2,4-DB	ug/L	0.14	-	0.14	0.14	1	0
0817	2,4-DB	ug/L	0.045	0.029	0.025	0.14	16	0
0826	2,4-DB	ug/L	0.043	0.029	0.025	0.135	16	0
0829	2,4-DB	ug/L	0.135	-	0.135	0.135	1	0
0831	2,4-DB	ug/L	0.044	0.029	0.025	0.14	17	0
0832	2,4-DB	ug/L	0.14	-	0.14	0.14	1	0
0834	2,4-DB	ug/L	0.044	0.028	0.025	0.135	17	0
0840	2,4-DB	ug/L	0.043	0.030	0.025	0.14	16	0
0852	2,4-DB	ug/L	0.044	0.029	0.025	0.135	15	0
0890	2,4-DB	ug/L	0.044	0.030	0.0035	0.135	16	0
4903	2,4-DB	ug/L	0.082	0.046	0.055	0.135	3	0
0560	2,4-Dichlorophenol	ug/L	0.485	-	0.485	0.485	1	0
0804	2,4-Dichlorophenol	ug/L	0.475	-	0.475	0.475	1	0
0807	2,4-Dichlorophenol	ug/L	0.063	0.12	0.02	0.5	16	0
0814	2,4-Dichlorophenol	ug/L	0.5	-	0.5	0.5	1	0
0817	2,4-Dichlorophenol	ug/L	0.061	0.11	0.02	0.475	16	0
0826	2,4-Dichlorophenol	ug/L	0.063	0.11	0.02	0.485	16	0
0829	2,4-Dichlorophenol	ug/L	0.5	-	0.5	0.5	1	0
0831	2,4-Dichlorophenol	ug/L	0.060	0.11	0.02	0.475	17	0
0832	2,4-Dichlorophenol	ug/L	0.5	-	0.5	0.5	1	0
0834	2,4-Dichlorophenol	ug/L	0.061	0.11	0.02	0.5	17	0
0840	2,4-Dichlorophenol	ug/L	0.063	0.11	0.02	0.485	16	0
0852	2,4-Dichlorophenol	ug/L	0.064	0.11	0.02	0.475	15	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0890	2,4-Dichlorophenol	ug/L	0.063	0.12	0.02	0.5	16	0
4903	2,4-Dichlorophenol	ug/L	0.18	0.27	0.02	0.485	3	0
0560	2,4-Dimethylphenol	ug/L	0.485	-	0.485	0.485	1	0
0804	2,4-Dimethylphenol	ug/L	0.475	-	0.475	0.475	1	0
0807	2,4-Dimethylphenol	ug/L	0.54	0.18	0.355	0.75	16	0
0814	2,4-Dimethylphenol	ug/L	0.5	-	0.5	0.5	1	0
0817	2,4-Dimethylphenol	ug/L	0.54	0.18	0.355	0.75	16	0
0826	2,4-Dimethylphenol	ug/L	0.56	0.17	0.355	0.75	16	0
0829	2,4-Dimethylphenol	ug/L	0.5	-	0.5	0.5	1	0
0831	2,4-Dimethylphenol	ug/L	0.55	0.18	0.355	0.75	17	0
0832	2,4-Dimethylphenol	ug/L	0.5	-	0.5	0.5	1	0
0834	2,4-Dimethylphenol	ug/L	0.55	0.17	0.355	0.75	17	0
0840	2,4-Dimethylphenol	ug/L	0.56	0.17	0.355	0.75	16	0
0852	2,4-Dimethylphenol	ug/L	0.55	0.17	0.355	0.7	15	0
0890	2,4-Dimethylphenol	ug/L	0.54	0.18	0.355	0.75	16	0
4903	2,4-Dimethylphenol	ug/L	0.40	0.071	0.355	0.485	3	0
0560	2,4-Dinitrophenol	ug/L	0.95	-	0.95	0.95	1	0
0804	2,4-Dinitrophenol	ug/L	0.95	-	0.95	0.95	1	0
0807	2,4-Dinitrophenol	ug/L	0.40	0.20	0.235	1	16	0
0814	2,4-Dinitrophenol	ug/L	1	-	1	1	1	0
0817	2,4-Dinitrophenol	ug/L	0.40	0.19	0.235	0.95	16	0
0826	2,4-Dinitrophenol	ug/L	0.42	0.18	0.235	0.95	16	0
0829	2,4-Dinitrophenol	ug/L	1	-	1	1	1	0
0831	2,4-Dinitrophenol	ug/L	0.41	0.18	0.235	0.95	17	0
0832	2,4-Dinitrophenol	ug/L	1	-	1	1	1	0
0834	2,4-Dinitrophenol	ug/L	0.41	0.19	0.235	1	17	0
0840	2,4-Dinitrophenol	ug/L	0.42	0.18	0.24	0.95	16	0
0852	2,4-Dinitrophenol	ug/L	0.41	0.19	0.235	0.95	15	0
0890	2,4-Dinitrophenol	ug/L	0.40	0.20	0.235	1	16	0
4903	2,4-Dinitrophenol	ug/L	0.48	0.41	0.235	0.95	3	0
0560	2,4-Dinitrotoluene	ug/L	0.195	-	0.195	0.195	1	0
0804	2,4-Dinitrotoluene	ug/L	0.19	-	0.19	0.19	1	0
0807	2,4-Dinitrotoluene	ug/L	0.027	0.048	0.01	0.205	16	0
0814	2,4-Dinitrotoluene	ug/L	0.2	-	0.2	0.2	1	0
0817	2,4-Dinitrotoluene	ug/L	0.026	0.044	0.01	0.19	16	0
0826	2,4-Dinitrotoluene	ug/L	0.027	0.045	0.01	0.195	16	0
0829	2,4-Dinitrotoluene	ug/L	0.2	-	0.2	0.2	1	0
0831	2,4-Dinitrotoluene	ug/L	0.026	0.043	0.01	0.19	17	0
0832	2,4-Dinitrotoluene	ug/L	0.2	-	0.2	0.2	1	0
0834	2,4-Dinitrotoluene	ug/L	0.027	0.046	0.01	0.205	17	0
0840	2,4-Dinitrotoluene	ug/L	0.028	0.045	0.01	0.195	16	0
0852	2,4-Dinitrotoluene	ug/L	0.027	0.045	0.01	0.19	15	0
0890	2,4-Dinitrotoluene	ug/L	0.027	0.046	0.01	0.2	16	0
4903	2,4-Dinitrotoluene	ug/L	0.072	0.11	0.01	0.195	3	0
0560	2,6-Dinitrotoluene	ug/L	0.195	-	0.195	0.195	1	0
0804	2,6-Dinitrotoluene	ug/L	0.19	-	0.19	0.19	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	2,6-Dinitrotoluene	ug/L	0.027	0.048	0.01	0.205	16	0
0814	2,6-Dinitrotoluene	ug/L	0.2	-	0.2	0.2	1	0
0817	2,6-Dinitrotoluene	ug/L	0.026	0.044	0.01	0.19	16	0
0826	2,6-Dinitrotoluene	ug/L	0.027	0.045	0.01	0.195	16	0
0829	2,6-Dinitrotoluene	ug/L	0.2	-	0.2	0.2	1	0
0831	2,6-Dinitrotoluene	ug/L	0.026	0.043	0.01	0.19	17	0
0832	2,6-Dinitrotoluene	ug/L	0.2	-	0.2	0.2	1	0
0834	2,6-Dinitrotoluene	ug/L	0.027	0.046	0.01	0.205	17	0
0840	2,6-Dinitrotoluene	ug/L	0.028	0.045	0.01	0.195	16	0
0852	2,6-Dinitrotoluene	ug/L	0.027	0.045	0.01	0.19	15	0
0890	2,6-Dinitrotoluene	ug/L	0.027	0.046	0.01	0.2	16	0
4903	2,6-Dinitrotoluene	ug/L	0.072	0.11	0.01	0.195	3	0
0560	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0804	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0807	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0814	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0817	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0826	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0829	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0831	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0832	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0834	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0840	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0852	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0890	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
4903	2-Butanone (MEK)	ug/L	2.5	-	2.5	2.5	1	0
0560	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0804	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0807	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0814	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0817	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0826	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0829	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0831	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0832	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0834	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0840	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0852	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0890	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
4903	2-Chloroethylvinyl ether	ug/L	0.5	-	0.5	0.5	1	0
0560	2-Chloronaphthalene	ug/L	0.29	-	0.29	0.29	1	0
0804	2-Chloronaphthalene	ug/L	0.285	-	0.285	0.285	1	0
0807	2-Chloronaphthalene	ug/L	0.022	0.075	0.0024	0.305	16	0
0814	2-Chloronaphthalene	ug/L	0.3	-	0.3	0.3	1	0
0817	2-Chloronaphthalene	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	2-Chloronaphthalene	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	2-Chloronaphthalene	ug/L	0.3	-	0.3	0.3	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0831	2-Chloronaphthalene	ug/L	0.020	0.068	0.0024	0.285	17	0
0832	2-Chloronaphthalene	ug/L	0.3	-	0.3	0.3	1	0
0834	2-Chloronaphthalene	ug/L	0.021	0.073	0.0024	0.305	17	0
0840	2-Chloronaphthalene	ug/L	0.022	0.072	0.0024	0.29	16	0
0852	2-Chloronaphthalene	ug/L	0.022	0.073	0.0024	0.285	15	0
0890	2-Chloronaphthalene	ug/L	0.022	0.074	0.0024	0.3	16	0
4903	2-Chloronaphthalene	ug/L	0.098	0.17	0.0024	0.29	3	0
0560	2-Chlorophenol	ug/L	0.95	-	0.95	0.95	1	0
0804	2-Chlorophenol	ug/L	0.95	-	0.95	0.95	1	0
0807	2-Chlorophenol	ug/L	0.094	0.24	0.02	1	16	0
0814	2-Chlorophenol	ug/L	1	-	1	1	1	0
0817	2-Chlorophenol	ug/L	0.091	0.23	0.02	0.95	16	0
0826	2-Chlorophenol	ug/L	0.092	0.23	0.02	0.95	16	0
0829	2-Chlorophenol	ug/L	1	-	1	1	1	0
0831	2-Chlorophenol	ug/L	0.088	0.22	0.02	0.95	17	0
0832	2-Chlorophenol	ug/L	1	-	1	1	1	0
0834	2-Chlorophenol	ug/L	0.091	0.23	0.02	1	17	0
0840	2-Chlorophenol	ug/L	0.093	0.23	0.02	0.95	16	0
0852	2-Chlorophenol	ug/L	0.095	0.24	0.02	0.95	15	0
0890	2-Chlorophenol	ug/L	0.094	0.24	0.02	1	16	0
4903	2-Chlorophenol	ug/L	0.33	0.54	0.02	0.95	3	0
0560	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0804	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0807	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0814	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0817	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0826	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0829	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0831	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0832	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0834	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0840	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0852	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0890	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
4903	2-Hexanone	ug/L	2.5	-	2.5	2.5	1	0
0560	2-Methylnaphthalene	ug/L	0.8	-	0.8	0.8	1	0
0804	2-Methylnaphthalene	ug/L	0.75	-	0.75	0.75	1	0
0807	2-Methylnaphthalene	ug/L	0.081	0.19	0.02	0.8	16	0
0814	2-Methylnaphthalene	ug/L	0.8	-	0.8	0.8	1	0
0817	2-Methylnaphthalene	ug/L	0.078	0.18	0.02	0.75	16	0
0826	2-Methylnaphthalene	ug/L	0.083	0.19	0.02	0.8	16	0
0829	2-Methylnaphthalene	ug/L	0.8	-	0.8	0.8	1	0
0831	2-Methylnaphthalene	ug/L	0.076	0.17	0.02	0.75	17	0
0832	2-Methylnaphthalene	ug/L	0.8	-	0.8	0.8	1	0
0834	2-Methylnaphthalene	ug/L	0.079	0.19	0.02	0.8	17	0
0840	2-Methylnaphthalene	ug/L	0.083	0.19	0.02	0.8	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0852	2-Methylnaphthalene	ug/L	0.082	0.19	0.02	0.75	15	0
0890	2-Methylnaphthalene	ug/L	0.081	0.19	0.02	0.8	16	0
4903	2-Methylnaphthalene	ug/L	0.28	0.45	0.02	0.8	3	0
0560	2-Methylphenol	ug/L	0.485	-	0.485	0.485	1	0
0804	2-Methylphenol	ug/L	0.475	-	0.475	0.475	1	0
0807	2-Methylphenol	ug/L	0.12	0.11	0.06	0.5	16	0
0814	2-Methylphenol	ug/L	0.5	-	0.5	0.5	1	0
0817	2-Methylphenol	ug/L	0.12	0.10	0.06	0.475	16	0
0826	2-Methylphenol	ug/L	0.12	0.10	0.06	0.485	16	0
0829	2-Methylphenol	ug/L	0.5	-	0.5	0.5	1	0
0831	2-Methylphenol	ug/L	0.12	0.097	0.06	0.475	17	0
0832	2-Methylphenol	ug/L	0.5	-	0.5	0.5	1	0
0834	2-Methylphenol	ug/L	0.12	0.10	0.06	0.5	17	0
0840	2-Methylphenol	ug/L	0.12	0.10	0.06	0.485	16	0
0852	2-Methylphenol	ug/L	0.12	0.10	0.06	0.475	15	0
0890	2-Methylphenol	ug/L	0.12	0.11	0.06	0.5	16	0
4903	2-Methylphenol	ug/L	0.20	0.25	0.06	0.485	3	0
0560	2-Nitroaniline	ug/L	1.95	-	1.95	1.95	1	0
0804	2-Nitroaniline	ug/L	1.9	-	1.9	1.9	1	0
0807	2-Nitroaniline	ug/L	0.16	0.50	0.02	2.05	16	0
0814	2-Nitroaniline	ug/L	2	-	2	2	1	0
0817	2-Nitroaniline	ug/L	0.15	0.47	0.02	1.9	16	0
0826	2-Nitroaniline	ug/L	0.15	0.48	0.02	1.95	16	0
0829	2-Nitroaniline	ug/L	2	-	2	2	1	0
0831	2-Nitroaniline	ug/L	0.14	0.45	0.02	1.9	17	0
0832	2-Nitroaniline	ug/L	2	-	2	2	1	0
0834	2-Nitroaniline	ug/L	0.15	0.49	0.02	2.05	17	0
0840	2-Nitroaniline	ug/L	0.16	0.48	0.02	1.95	16	0
0852	2-Nitroaniline	ug/L	0.16	0.48	0.02	1.9	15	0
0890	2-Nitroaniline	ug/L	0.16	0.49	0.02	2	16	0
4903	2-Nitroaniline	ug/L	0.67	1.1	0.02	1.95	3	0
0560	2-Nitrophenol	ug/L	0.485	-	0.485	0.485	1	0
0804	2-Nitrophenol	ug/L	0.475	-	0.475	0.475	1	0
0807	2-Nitrophenol	ug/L	0.046	0.12	0.01	0.5	16	0
0814	2-Nitrophenol	ug/L	0.5	-	0.5	0.5	1	0
0817	2-Nitrophenol	ug/L	0.044	0.12	0.01	0.475	16	0
0826	2-Nitrophenol	ug/L	0.045	0.12	0.01	0.485	16	0
0829	2-Nitrophenol	ug/L	0.5	-	0.5	0.5	1	0
0831	2-Nitrophenol	ug/L	0.043	0.11	0.01	0.475	17	0
0832	2-Nitrophenol	ug/L	0.5	-	0.5	0.5	1	0
0834	2-Nitrophenol	ug/L	0.044	0.12	0.01	0.5	17	0
0840	2-Nitrophenol	ug/L	0.046	0.12	0.01	0.485	16	0
0852	2-Nitrophenol	ug/L	0.046	0.12	0.01	0.475	15	0
0890	2-Nitrophenol	ug/L	0.046	0.12	0.01	0.5	16	1
4903	2-Nitrophenol	ug/L	0.17	0.27	0.01	0.485	3	0
0560	3,3'-Dichlorobenzidine	ug/L	0.485	-	0.485	0.485	1	0
0804	3,3'-Dichlorobenzidine	ug/L	0.475	-	0.475	0.475	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	3,3'-Dichlorobenzidine	ug/L	0.29	0.11	0.175	0.5	16	0
0814	3,3'-Dichlorobenzidine	ug/L	0.5	-	0.5	0.5	1	0
0817	3,3'-Dichlorobenzidine	ug/L	0.29	0.10	0.175	0.475	16	0
0826	3,3'-Dichlorobenzidine	ug/L	0.30	0.10	0.175	0.485	16	0
0829	3,3'-Dichlorobenzidine	ug/L	0.5	-	0.5	0.5	1	0
0831	3,3'-Dichlorobenzidine	ug/L	0.29	0.10	0.175	0.475	17	0
0832	3,3'-Dichlorobenzidine	ug/L	0.5	-	0.5	0.5	1	0
0834	3,3'-Dichlorobenzidine	ug/L	0.29	0.10	0.175	0.5	17	0
0840	3,3'-Dichlorobenzidine	ug/L	0.30	0.10	0.18	0.485	16	0
0852	3,3'-Dichlorobenzidine	ug/L	0.29	0.10	0.175	0.475	15	0
0890	3,3'-Dichlorobenzidine	ug/L	0.29	0.11	0.175	0.5	16	0
4903	3,3'-Dichlorobenzidine	ug/L	0.28	0.18	0.175	0.485	3	0
0560	3-Nitroaniline	ug/L	1.95	-	1.95	1.95	1	0
0804	3-Nitroaniline	ug/L	1.9	-	1.9	1.9	1	0
0807	3-Nitroaniline	ug/L	0.30	0.47	0.12	2.05	16	0
0814	3-Nitroaniline	ug/L	2	-	2	2	1	0
0817	3-Nitroaniline	ug/L	0.29	0.43	0.12	1.9	16	0
0826	3-Nitroaniline	ug/L	0.30	0.44	0.12	1.95	16	0
0829	3-Nitroaniline	ug/L	2	-	2	2	1	0
0831	3-Nitroaniline	ug/L	0.29	0.42	0.12	1.9	17	0
0832	3-Nitroaniline	ug/L	2	-	2	2	1	0
0834	3-Nitroaniline	ug/L	0.30	0.46	0.12	2.05	17	0
0840	3-Nitroaniline	ug/L	0.30	0.44	0.12	1.95	16	0
0852	3-Nitroaniline	ug/L	0.30	0.45	0.12	1.9	15	0
0890	3-Nitroaniline	ug/L	0.30	0.46	0.12	2	16	0
4903	3-Nitroaniline	ug/L	0.73	1.1	0.12	1.95	3	0
0560	4,4'-DDD	ug/L	0.02	-	0.02	0.02	1	0
0804	4,4'-DDD	ug/L	0.02	-	0.02	0.02	1	0
0807	4,4'-DDD	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	4,4'-DDD	ug/L	0.025	-	0.025	0.025	1	0
0817	4,4'-DDD	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	4,4'-DDD	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	4,4'-DDD	ug/L	0.025	-	0.025	0.025	1	0
0831	4,4'-DDD	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	4,4'-DDD	ug/L	0.025	-	0.025	0.025	1	0
0834	4,4'-DDD	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	4,4'-DDD	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	4,4'-DDD	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	4,4'-DDD	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	4,4'-DDD	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	4,4'-DDE	ug/L	0.02	-	0.02	0.02	1	0
0804	4,4'-DDE	ug/L	0.02	-	0.02	0.02	1	0
0807	4,4'-DDE	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	4,4'-DDE	ug/L	0.025	-	0.025	0.025	1	0
0817	4,4'-DDE	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	4,4'-DDE	ug/L	0.0035	0.0044	0.0024	0.02	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0829	4,4'-DDE	ug/L	0.025	-	0.025	0.025	1	0
0831	4,4'-DDE	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	4,4'-DDE	ug/L	0.025	-	0.025	0.025	1	0
0834	4,4'-DDE	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	4,4'-DDE	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	4,4'-DDE	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	4,4'-DDE	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	4,4'-DDE	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	4,4'-DDT	ug/L	0.02	-	0.02	0.02	1	0
0804	4,4'-DDT	ug/L	0.02	-	0.02	0.02	1	0
0807	4,4'-DDT	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	4,4'-DDT	ug/L	0.025	-	0.025	0.025	1	0
0817	4,4'-DDT	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	4,4'-DDT	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	4,4'-DDT	ug/L	0.025	-	0.025	0.025	1	0
0831	4,4'-DDT	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	4,4'-DDT	ug/L	0.025	-	0.025	0.025	1	0
0834	4,4'-DDT	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	4,4'-DDT	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	4,4'-DDT	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	4,4'-DDT	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	4,4'-DDT	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	4,6-Dinitro-O-Cresol	ug/L	0.95	-	0.95	0.95	1	0
0804	4,6-Dinitro-O-Cresol	ug/L	0.95	-	0.95	0.95	1	0
0807	4,6-Dinitro-O-Cresol	ug/L	0.40	0.20	0.235	1	16	0
0814	4,6-Dinitro-O-Cresol	ug/L	1	-	1	1	1	0
0817	4,6-Dinitro-O-Cresol	ug/L	0.40	0.19	0.235	0.95	16	0
0826	4,6-Dinitro-O-Cresol	ug/L	0.42	0.18	0.235	0.95	16	0
0829	4,6-Dinitro-O-Cresol	ug/L	1	-	1	1	1	0
0831	4,6-Dinitro-O-Cresol	ug/L	0.41	0.18	0.235	0.95	17	0
0832	4,6-Dinitro-O-Cresol	ug/L	1	-	1	1	1	0
0834	4,6-Dinitro-O-Cresol	ug/L	0.41	0.19	0.235	1	17	0
0840	4,6-Dinitro-O-Cresol	ug/L	0.42	0.18	0.24	0.95	16	0
0852	4,6-Dinitro-O-Cresol	ug/L	0.41	0.19	0.235	0.95	15	0
0890	4,6-Dinitro-O-Cresol	ug/L	0.40	0.20	0.235	1	16	0
4903	4,6-Dinitro-O-Cresol	ug/L	0.48	0.41	0.235	0.95	3	0
0560	4-Bromophenyl Phenyl Ether	ug/L	0.195	-	0.195	0.195	1	0
0804	4-Bromophenyl Phenyl Ether	ug/L	0.19	-	0.19	0.19	1	0
0807	4-Bromophenyl Phenyl Ether	ug/L	0.020	0.049	0.005	0.205	16	0
0814	4-Bromophenyl Phenyl Ether	ug/L	0.2	-	0.2	0.2	1	0
0817	4-Bromophenyl Phenyl Ether	ug/L	0.019	0.046	0.005	0.19	16	0
0826	4-Bromophenyl Phenyl Ether	ug/L	0.020	0.047	0.005	0.195	16	0
0829	4-Bromophenyl Phenyl Ether	ug/L	0.2	-	0.2	0.2	1	0
0831	4-Bromophenyl Phenyl Ether	ug/L	0.019	0.044	0.005	0.19	17	0
0832	4-Bromophenyl Phenyl Ether	ug/L	0.2	-	0.2	0.2	1	0
0834	4-Bromophenyl Phenyl Ether	ug/L	0.019	0.048	0.005	0.205	17	0
0840	4-Bromophenyl Phenyl Ether	ug/L	0.020	0.047	0.005	0.195	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0852	4-Bromophenyl Phenyl Ether	ug/L	0.020	0.047	0.005	0.19	15	0
0890	4-Bromophenyl Phenyl Ether	ug/L	0.020	0.048	0.005	0.2	16	0
4903	4-Bromophenyl Phenyl Ether	ug/L	0.068	0.11	0.005	0.195	3	0
0560	4-Chloro-3-Methylphenol	ug/L	0.95	-	0.95	0.95	1	0
0804	4-Chloro-3-Methylphenol	ug/L	0.95	-	0.95	0.95	1	0
0807	4-Chloro-3-Methylphenol	ug/L	0.15	0.23	0.06	1	16	0
0814	4-Chloro-3-Methylphenol	ug/L	1	-	1	1	1	0
0817	4-Chloro-3-Methylphenol	ug/L	0.15	0.22	0.06	0.95	16	0
0826	4-Chloro-3-Methylphenol	ug/L	0.15	0.22	0.06	0.95	16	0
0829	4-Chloro-3-Methylphenol	ug/L	1	-	1	1	1	0
0831	4-Chloro-3-Methylphenol	ug/L	0.14	0.21	0.06	0.95	17	0
0832	4-Chloro-3-Methylphenol	ug/L	1	-	1	1	1	0
0834	4-Chloro-3-Methylphenol	ug/L	0.15	0.22	0.06	1	17	0
0840	4-Chloro-3-Methylphenol	ug/L	0.15	0.22	0.06	0.95	16	0
0852	4-Chloro-3-Methylphenol	ug/L	0.15	0.22	0.06	0.95	15	0
0890	4-Chloro-3-Methylphenol	ug/L	0.15	0.23	0.06	1	16	0
4903	4-Chloro-3-Methylphenol	ug/L	0.36	0.51	0.06	0.95	3	0
0560	4-Chloroaniline	ug/L	0.95	-	0.95	0.95	1	0
0804	4-Chloroaniline	ug/L	0.95	-	0.95	0.95	1	0
0807	4-Chloroaniline	ug/L	0.15	0.23	0.06	1	16	0
0814	4-Chloroaniline	ug/L	1	-	1	1	1	0
0817	4-Chloroaniline	ug/L	0.15	0.22	0.06	0.95	16	0
0826	4-Chloroaniline	ug/L	0.15	0.22	0.06	0.95	16	0
0829	4-Chloroaniline	ug/L	1	-	1	1	1	0
0831	4-Chloroaniline	ug/L	0.14	0.21	0.06	0.95	17	0
0832	4-Chloroaniline	ug/L	1	-	1	1	1	0
0834	4-Chloroaniline	ug/L	0.15	0.22	0.06	1	17	0
0840	4-Chloroaniline	ug/L	0.15	0.22	0.06	0.95	16	0
0852	4-Chloroaniline	ug/L	0.15	0.22	0.06	0.95	15	0
0890	4-Chloroaniline	ug/L	0.15	0.23	0.06	1	16	0
4903	4-Chloroaniline	ug/L	0.36	0.51	0.06	0.95	3	0
0560	4-Chlorophenyl Phenyl Ether	ug/L	0.29	-	0.29	0.29	1	0
0804	4-Chlorophenyl Phenyl Ether	ug/L	0.285	-	0.285	0.285	1	0
0807	4-Chlorophenyl Phenyl Ether	ug/L	0.026	0.074	0.005	0.305	16	0
0814	4-Chlorophenyl Phenyl Ether	ug/L	0.3	-	0.3	0.3	1	0
0817	4-Chlorophenyl Phenyl Ether	ug/L	0.025	0.069	0.005	0.285	16	0
0826	4-Chlorophenyl Phenyl Ether	ug/L	0.026	0.071	0.005	0.29	16	0
0829	4-Chlorophenyl Phenyl Ether	ug/L	0.3	-	0.3	0.3	1	0
0831	4-Chlorophenyl Phenyl Ether	ug/L	0.024	0.067	0.005	0.285	17	0
0832	4-Chlorophenyl Phenyl Ether	ug/L	0.3	-	0.3	0.3	1	0
0834	4-Chlorophenyl Phenyl Ether	ug/L	0.025	0.072	0.005	0.305	17	0
0840	4-Chlorophenyl Phenyl Ether	ug/L	0.026	0.071	0.005	0.29	16	0
0852	4-Chlorophenyl Phenyl Ether	ug/L	0.026	0.072	0.005	0.285	15	0
0890	4-Chlorophenyl Phenyl Ether	ug/L	0.026	0.073	0.005	0.3	16	0
4903	4-Chlorophenyl Phenyl Ether	ug/L	0.1	0.16	0.005	0.29	3	0
0560	4-Methyl-2-Pentanone	ug/L	2.5	-	2.5	2.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
	(MIBK)							
0804	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0807	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0814	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0817	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0826	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0829	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0831	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0832	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0834	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0840	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0852	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0890	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
4903	4-Methyl-2-Pentanone (MIBK)	ug/L	2.5	-	2.5	2.5	1	0
0560	4-Methylphenol	ug/L	0.485	-	0.485	0.485	1	0
0804	4-Methylphenol	ug/L	0.475	-	0.475	0.475	1	0
0807	4-Methylphenol	ug/L	0.12	0.11	0.06	0.5	16	0
0814	4-Methylphenol	ug/L	0.5	-	0.5	0.5	1	0
0817	4-Methylphenol	ug/L	0.12	0.10	0.06	0.475	16	0
0826	4-Methylphenol	ug/L	0.12	0.10	0.06	0.485	16	0
0829	4-Methylphenol	ug/L	0.5	-	0.5	0.5	1	0
0831	4-Methylphenol	ug/L	0.12	0.097	0.06	0.475	17	0
0832	4-Methylphenol	ug/L	0.5	-	0.5	0.5	1	0
0834	4-Methylphenol	ug/L	0.12	0.10	0.06	0.5	17	0
0840	4-Methylphenol	ug/L	0.12	0.10	0.06	0.485	16	0
0852	4-Methylphenol	ug/L	0.12	0.10	0.06	0.475	15	0
0890	4-Methylphenol	ug/L	0.12	0.11	0.06	0.5	16	0
4903	4-Methylphenol	ug/L	0.20	0.25	0.06	0.485	3	0
0560	4-Nitroaniline	ug/L	1.95	-	1.95	1.95	1	0
0804	4-Nitroaniline	ug/L	1.9	-	1.9	1.9	1	0
0807	4-Nitroaniline	ug/L	0.30	0.47	0.12	2.05	16	0
0814	4-Nitroaniline	ug/L	2	-	2	2	1	0
0817	4-Nitroaniline	ug/L	0.29	0.43	0.12	1.9	16	0
0826	4-Nitroaniline	ug/L	0.30	0.44	0.12	1.95	16	0
0829	4-Nitroaniline	ug/L	2	-	2	2	1	0
0831	4-Nitroaniline	ug/L	0.29	0.42	0.12	1.9	17	0
0832	4-Nitroaniline	ug/L	2	-	2	2	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0834	4-Nitroaniline	ug/L	0.30	0.46	0.12	2.05	17	0
0840	4-Nitroaniline	ug/L	0.30	0.44	0.12	1.95	16	0
0852	4-Nitroaniline	ug/L	0.30	0.45	0.12	1.9	15	0
0890	4-Nitroaniline	ug/L	0.30	0.46	0.12	2	16	0
4903	4-Nitroaniline	ug/L	0.73	1.1	0.12	1.95	3	0
0560	4-Nitrophenol	ug/L	0.95	-	0.95	0.95	1	0
0804	4-Nitrophenol	ug/L	0.95	-	0.95	0.95	1	0
0807	4-Nitrophenol	ug/L	0.23	0.21	0.12	1	16	0
0814	4-Nitrophenol	ug/L	1	-	1	1	1	0
0817	4-Nitrophenol	ug/L	0.23	0.20	0.12	0.95	16	0
0826	4-Nitrophenol	ug/L	0.24	0.20	0.12	0.95	16	0
0829	4-Nitrophenol	ug/L	1	-	1	1	1	0
0831	4-Nitrophenol	ug/L	0.23	0.19	0.12	0.95	17	0
0832	4-Nitrophenol	ug/L	1	-	1	1	1	0
0834	4-Nitrophenol	ug/L	0.23	0.21	0.12	1	17	0
0840	4-Nitrophenol	ug/L	0.24	0.20	0.12	0.95	16	0
0852	4-Nitrophenol	ug/L	0.24	0.21	0.12	0.95	15	0
0890	4-Nitrophenol	ug/L	0.23	0.21	0.12	1	16	0
4903	4-Nitrophenol	ug/L	0.40	0.48	0.12	0.95	3	0
0560	Acenaphthene	ug/L	0.195	-	0.195	0.195	1	0
0804	Acenaphthene	ug/L	0.19	-	0.19	0.19	1	0
0807	Acenaphthene	ug/L	0.016	0.050	0.0024	0.205	16	0
0814	Acenaphthene	ug/L	0.2	-	0.2	0.2	1	0
0817	Acenaphthene	ug/L	0.015	0.047	0.0024	0.19	16	0
0826	Acenaphthene	ug/L	0.016	0.048	0.0024	0.195	16	0
0829	Acenaphthene	ug/L	0.2	-	0.2	0.2	1	0
0831	Acenaphthene	ug/L	0.015	0.045	0.0024	0.19	17	0
0832	Acenaphthene	ug/L	0.2	-	0.2	0.2	1	0
0834	Acenaphthene	ug/L	0.016	0.049	0.0024	0.205	17	0
0840	Acenaphthene	ug/L	0.016	0.048	0.0024	0.195	16	0
0852	Acenaphthene	ug/L	0.016	0.048	0.0024	0.19	15	0
0890	Acenaphthene	ug/L	0.016	0.049	0.0024	0.2	16	0
4903	Acenaphthene	ug/L	0.067	0.11	0.0024	0.195	3	0
0560	Acenaphthylene	ug/L	0.29	-	0.29	0.29	1	0
0804	Acenaphthylene	ug/L	0.285	-	0.285	0.285	1	0
0807	Acenaphthylene	ug/L	0.022	0.075	0.0024	0.305	16	0
0814	Acenaphthylene	ug/L	0.3	-	0.3	0.3	1	0
0817	Acenaphthylene	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	Acenaphthylene	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	Acenaphthylene	ug/L	0.3	-	0.3	0.3	1	0
0831	Acenaphthylene	ug/L	0.020	0.068	0.0024	0.285	17	0
0832	Acenaphthylene	ug/L	0.3	-	0.3	0.3	1	0
0834	Acenaphthylene	ug/L	0.022	0.073	0.0024	0.305	17	1
0840	Acenaphthylene	ug/L	0.022	0.071	0.0024	0.29	16	1
0852	Acenaphthylene	ug/L	0.022	0.073	0.0024	0.285	15	0
0890	Acenaphthylene	ug/L	0.022	0.074	0.0024	0.3	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
4903	Acenaphthylene	ug/L	0.098	0.17	0.0024	0.29	3	0
0560	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0804	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0807	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0814	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0817	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0826	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0829	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0831	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0832	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0834	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0840	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0852	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0890	Acetone	ug/L	2.5	-	2.5	2.5	1	0
4903	Acetone	ug/L	2.5	-	2.5	2.5	1	0
0560	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0804	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0807	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0814	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0817	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0826	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0829	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0831	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0832	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0834	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0840	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0852	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0890	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
4903	Acrolein	ug/L	2.5	-	2.5	2.5	1	0
0560	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0804	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0807	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0814	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0817	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0826	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0829	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0831	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0832	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0834	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0840	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0852	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0890	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
4903	Acrylonitrile	ug/L	2.5	-	2.5	2.5	1	0
0560	Aldrin	ug/L	0.02	-	0.02	0.02	1	0
0804	Aldrin	ug/L	0.02	-	0.02	0.02	1	0
0807	Aldrin	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Aldrin	ug/L	0.025	-	0.025	0.025	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0817	Aldrin	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Aldrin	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Aldrin	ug/L	0.025	-	0.025	0.025	1	0
0831	Aldrin	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Aldrin	ug/L	0.025	-	0.025	0.025	1	0
0834	Aldrin	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Aldrin	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Aldrin	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Aldrin	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Aldrin	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Alpha-BHC	ug/L	0.02	-	0.02	0.02	1	0
0804	Alpha-BHC	ug/L	0.02	-	0.02	0.02	1	0
0807	Alpha-BHC	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Alpha-BHC	ug/L	0.025	-	0.025	0.025	1	0
0817	Alpha-BHC	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Alpha-BHC	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Alpha-BHC	ug/L	0.025	-	0.025	0.025	1	0
0831	Alpha-BHC	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Alpha-BHC	ug/L	0.025	-	0.025	0.025	1	0
0834	Alpha-BHC	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Alpha-BHC	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Alpha-BHC	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Alpha-BHC	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Alpha-BHC	ug/L	0.0084	0.010	0.0024	0.02	3	0
0804	Aluminum, Dissolved	mg/L	0.0026	0.0026	0.001	0.01	18	7
0807	Aluminum, Dissolved	mg/L	0.0016	0.0013	0.001	0.0047	16	3
0814	Aluminum, Dissolved	mg/L	0.0013	0.00083	0.001	0.0036	17	2
0817	Aluminum, Dissolved	mg/L	0.0017	0.0012	0.001	0.0049	18	5
0826	Aluminum, Dissolved	mg/L	0.028	0.024	0.001	0.05	39	5
0829	Aluminum, Dissolved	mg/L	0.0016	0.0013	0.001	0.0055	18	4
0831	Aluminum, Dissolved	mg/L	0.029	0.024	0.001	0.05	37	4
0832	Aluminum, Dissolved	mg/L	0.0017	0.0015	0.001	0.0052	8	2
0834	Aluminum, Dissolved	mg/L	0.0014	0.0011	0.001	0.0045	16	2
0840	Aluminum, Dissolved	mg/L	0.0020	0.0016	0.001	0.0054	17	5
0852	Aluminum, Dissolved	mg/L	0.027	0.025	0.001	0.05	40	3
0890	Aluminum, Dissolved	mg/L	0.028	0.025	0.001	0.05	39	2
4903	Aluminum, Dissolved	mg/L	0.0020	0.0021	0.001	0.0065	8	2
0560	Aluminum, Total	mg/L	0.05	-	0.05	0.05	1	0
0804	Aluminum, Total	mg/L	0.025	0.036	0.0033	0.16	19	18
0807	Aluminum, Total	mg/L	0.018	0.019	0.0024	0.06	17	16
0814	Aluminum, Total	mg/L	0.014	0.029	0.001	0.13	18	17
0817	Aluminum, Total	mg/L	0.026	0.065	0.0035	0.29	19	19
0826	Aluminum, Total	mg/L	0.031	0.021	0.0023	0.05	40	18
0829	Aluminum, Total	mg/L	0.029	0.071	0.0028	0.32	19	19
0831	Aluminum, Total	mg/L	0.049	0.10	0.0026	0.64	38	17
0832	Aluminum, Total	mg/L	0.073	0.19	0.0048	0.57	9	9

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0834	Aluminum, Total	mg/L	0.12	0.37	0.0035	1.52	17	17
0840	Aluminum, Total	mg/L	0.019	0.036	0.0031	0.16	18	18
0852	Aluminum, Total	mg/L	0.031	0.021	0.0023	0.05	41	19
0890	Aluminum, Total	mg/L	0.034	0.022	0.0027	0.1	40	19
4903	Aluminum, Total	mg/L	0.20	0.44	0.004	1.36	9	9
0560	Aniline	ug/L	0.95	-	0.95	0.95	1	0
0804	Aniline	ug/L	0.95	-	0.95	0.95	1	0
0807	Aniline	ug/L	1	-	1	1	1	0
0814	Aniline	ug/L	1	-	1	1	1	0
0817	Aniline	ug/L	0.95	-	0.95	0.95	1	0
0826	Aniline	ug/L	0.95	-	0.95	0.95	1	0
0829	Aniline	ug/L	1	-	1	1	1	0
0831	Aniline	ug/L	0.95	-	0.95	0.95	1	0
0832	Aniline	ug/L	1	-	1	1	1	0
0834	Aniline	ug/L	1	-	1	1	1	0
0840	Aniline	ug/L	0.95	-	0.95	0.95	1	0
0852	Aniline	ug/L	0.95	-	0.95	0.95	1	0
0890	Aniline	ug/L	1	-	1	1	1	0
4903	Aniline	ug/L	0.95	-	0.95	0.95	1	0
0560	Anthracene	ug/L	0.29	-	0.29	0.29	1	0
0804	Anthracene	ug/L	0.285	-	0.285	0.285	1	0
0807	Anthracene	ug/L	0.022	0.075	0.0024	0.305	16	0
0814	Anthracene	ug/L	0.3	-	0.3	0.3	1	0
0817	Anthracene	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	Anthracene	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	Anthracene	ug/L	0.3	-	0.3	0.3	1	0
0831	Anthracene	ug/L	0.020	0.068	0.0024	0.285	17	0
0832	Anthracene	ug/L	0.3	-	0.3	0.3	1	0
0834	Anthracene	ug/L	0.021	0.073	0.0024	0.305	17	0
0840	Anthracene	ug/L	0.022	0.072	0.0024	0.29	16	0
0852	Anthracene	ug/L	0.022	0.073	0.0024	0.285	15	0
0890	Anthracene	ug/L	0.022	0.074	0.0024	0.3	16	0
4903	Anthracene	ug/L	0.098	0.17	0.0024	0.29	3	0
0804	Antimony, Dissolved	mg/L	0.00011	0.0000073	1E-04	0.00013	18	18
0807	Antimony, Dissolved	mg/L	0.00011	0.0000062	1E-04	0.00012	16	16
0814	Antimony, Dissolved	mg/L	0.00011	0.0000056	9E-05	0.00011	17	17
0817	Antimony, Dissolved	mg/L	0.00011	0.0000044	0.0001	0.00012	18	18
0826	Antimony, Dissolved	mg/L	0.00018	0.000073	1E-04	0.00025	38	18
0829	Antimony, Dissolved	mg/L	0.00010	0.0000063	9E-05	0.00011	18	18
0831	Antimony, Dissolved	mg/L	0.00018	0.000076	9E-05	0.00025	36	16
0832	Antimony, Dissolved	mg/L	0.00011	0.0000073	9E-05	0.00012	8	8
0834	Antimony, Dissolved	mg/L	0.00012	0.000031	1E-04	0.00023	16	16
0840	Antimony, Dissolved	mg/L	0.00010	0.0000058	9E-05	0.00011	17	17
0852	Antimony, Dissolved	mg/L	0.00018	0.000074	9E-05	0.00025	39	19
0890	Antimony, Dissolved	mg/L	0.00018	0.000075	9E-05	0.00025	38	18
4903	Antimony, Dissolved	mg/L	0.00011	0.000010	0.0001	0.00013	8	8
0560	Antimony, Total	mg/L	0.00025	-	0.0003	0.00025	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0804	Antimony, Total	mg/L	0.00012	0.000033	0.0001	0.00025	19	18
0807	Antimony, Total	mg/L	0.00012	0.000034	0.0001	0.00025	17	16
0814	Antimony, Total	mg/L	0.00012	0.000034	0.0001	0.00025	18	17
0817	Antimony, Total	mg/L	0.00012	0.000032	0.0001	0.00025	19	18
0826	Antimony, Total	mg/L	0.00019	0.000071	0.0001	0.00025	40	18
0829	Antimony, Total	mg/L	0.00011	0.000035	9E-05	0.00025	19	18
0831	Antimony, Total	mg/L	0.00019	0.000076	9E-05	0.00025	38	16
0832	Antimony, Total	mg/L	0.00012	0.000048	9E-05	0.00025	9	8
0834	Antimony, Total	mg/L	0.00012	0.000037	8E-05	0.00025	17	16
0840	Antimony, Total	mg/L	0.00011	0.000035	9E-05	0.00025	18	17
0852	Antimony, Total	mg/L	0.00018	0.000073	1E-04	0.00025	41	19
0890	Antimony, Total	mg/L	0.00055	0.0023	1E-04	0.015	41	18
4903	Antimony, Total	mg/L	0.00014	0.000059	0.0001	0.00025	9	8
0560	Aroclor 1016	ug/L	0.245	-	0.245	0.245	1	0
0804	Aroclor 1016	ug/L	0.24	-	0.24	0.24	1	0
0807	Aroclor 1016	ug/L	0.036	0.058	0.02	0.255	16	0
0814	Aroclor 1016	ug/L	0.25	-	0.25	0.25	1	0
0817	Aroclor 1016	ug/L	0.034	0.055	0.02	0.24	16	0
0826	Aroclor 1016	ug/L	0.035	0.056	0.02	0.245	16	0
0829	Aroclor 1016	ug/L	0.25	-	0.25	0.25	1	0
0831	Aroclor 1016	ug/L	0.034	0.053	0.02	0.24	17	0
0832	Aroclor 1016	ug/L	0.25	-	0.25	0.25	1	0
0834	Aroclor 1016	ug/L	0.035	0.057	0.02	0.255	17	0
0840	Aroclor 1016	ug/L	0.035	0.056	0.02	0.245	16	0
0852	Aroclor 1016	ug/L	0.035	0.057	0.02	0.24	15	0
0890	Aroclor 1016	ug/L	0.035	0.057	0.02	0.25	16	0
4903	Aroclor 1016	ug/L	0.097	0.13	0.02	0.245	3	0
0560	Aroclor 1221	ug/L	0.245	-	0.245	0.245	1	0
0804	Aroclor 1221	ug/L	0.24	-	0.24	0.24	1	0
0807	Aroclor 1221	ug/L	0.036	0.058	0.02	0.255	16	0
0814	Aroclor 1221	ug/L	0.25	-	0.25	0.25	1	0
0817	Aroclor 1221	ug/L	0.034	0.055	0.02	0.24	16	0
0826	Aroclor 1221	ug/L	0.035	0.056	0.02	0.245	16	0
0829	Aroclor 1221	ug/L	0.25	-	0.25	0.25	1	0
0831	Aroclor 1221	ug/L	0.034	0.053	0.02	0.24	17	0
0832	Aroclor 1221	ug/L	0.25	-	0.25	0.25	1	0
0834	Aroclor 1221	ug/L	0.035	0.057	0.02	0.255	17	0
0840	Aroclor 1221	ug/L	0.035	0.056	0.02	0.245	16	0
0852	Aroclor 1221	ug/L	0.035	0.057	0.02	0.24	15	0
0890	Aroclor 1221	ug/L	0.035	0.057	0.02	0.25	16	0
4903	Aroclor 1221	ug/L	0.097	0.13	0.02	0.245	3	0
0560	Aroclor 1232	ug/L	0.245	-	0.245	0.245	1	0
0804	Aroclor 1232	ug/L	0.24	-	0.24	0.24	1	0
0807	Aroclor 1232	ug/L	0.036	0.058	0.02	0.255	16	0
0814	Aroclor 1232	ug/L	0.25	-	0.25	0.25	1	0
0817	Aroclor 1232	ug/L	0.034	0.055	0.02	0.24	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0826	Aroclor 1232	ug/L	0.035	0.056	0.02	0.245	16	0
0829	Aroclor 1232	ug/L	0.25	-	0.25	0.25	1	0
0831	Aroclor 1232	ug/L	0.034	0.053	0.02	0.24	17	0
0832	Aroclor 1232	ug/L	0.25	-	0.25	0.25	1	0
0834	Aroclor 1232	ug/L	0.035	0.057	0.02	0.255	17	0
0840	Aroclor 1232	ug/L	0.035	0.056	0.02	0.245	16	0
0852	Aroclor 1232	ug/L	0.035	0.057	0.02	0.24	15	0
0890	Aroclor 1232	ug/L	0.035	0.057	0.02	0.25	16	0
4903	Aroclor 1232	ug/L	0.097	0.13	0.02	0.245	3	0
0560	Aroclor 1242	ug/L	0.245	-	0.245	0.245	1	0
0804	Aroclor 1242	ug/L	0.24	-	0.24	0.24	1	0
0807	Aroclor 1242	ug/L	0.036	0.058	0.02	0.255	16	0
0814	Aroclor 1242	ug/L	0.25	-	0.25	0.25	1	0
0817	Aroclor 1242	ug/L	0.034	0.055	0.02	0.24	16	0
0826	Aroclor 1242	ug/L	0.035	0.056	0.02	0.245	16	0
0829	Aroclor 1242	ug/L	0.25	-	0.25	0.25	1	0
0831	Aroclor 1242	ug/L	0.034	0.053	0.02	0.24	17	0
0832	Aroclor 1242	ug/L	0.25	-	0.25	0.25	1	0
0834	Aroclor 1242	ug/L	0.035	0.057	0.02	0.255	17	0
0840	Aroclor 1242	ug/L	0.035	0.056	0.02	0.245	16	0
0852	Aroclor 1242	ug/L	0.035	0.057	0.02	0.24	15	0
0890	Aroclor 1242	ug/L	0.035	0.057	0.02	0.25	16	0
4903	Aroclor 1242	ug/L	0.097	0.13	0.02	0.245	3	0
0560	Aroclor 1248	ug/L	0.245	-	0.245	0.245	1	0
0804	Aroclor 1248	ug/L	0.24	-	0.24	0.24	1	0
0807	Aroclor 1248	ug/L	0.036	0.058	0.02	0.255	16	0
0814	Aroclor 1248	ug/L	0.25	-	0.25	0.25	1	0
0817	Aroclor 1248	ug/L	0.034	0.055	0.02	0.24	16	0
0826	Aroclor 1248	ug/L	0.035	0.056	0.02	0.245	16	0
0829	Aroclor 1248	ug/L	0.25	-	0.25	0.25	1	0
0831	Aroclor 1248	ug/L	0.034	0.053	0.02	0.24	17	0
0832	Aroclor 1248	ug/L	0.25	-	0.25	0.25	1	0
0834	Aroclor 1248	ug/L	0.035	0.057	0.02	0.255	17	0
0840	Aroclor 1248	ug/L	0.035	0.056	0.02	0.245	16	0
0852	Aroclor 1248	ug/L	0.035	0.057	0.02	0.24	15	0
0890	Aroclor 1248	ug/L	0.035	0.057	0.02	0.25	16	0
4903	Aroclor 1248	ug/L	0.097	0.13	0.02	0.245	3	0
0560	Aroclor 1254	ug/L	0.245	-	0.245	0.245	1	0
0804	Aroclor 1254	ug/L	0.24	-	0.24	0.24	1	0
0807	Aroclor 1254	ug/L	0.036	0.058	0.02	0.255	16	0
0814	Aroclor 1254	ug/L	0.25	-	0.25	0.25	1	0
0817	Aroclor 1254	ug/L	0.034	0.055	0.02	0.24	16	0
0826	Aroclor 1254	ug/L	0.035	0.056	0.02	0.245	16	0
0829	Aroclor 1254	ug/L	0.25	-	0.25	0.25	1	0
0831	Aroclor 1254	ug/L	0.034	0.053	0.02	0.24	17	0
0832	Aroclor 1254	ug/L	0.25	-	0.25	0.25	1	0
0834	Aroclor 1254	ug/L	0.035	0.057	0.02	0.255	17	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0840	Aroclor 1254	ug/L	0.035	0.056	0.02	0.245	16	0
0852	Aroclor 1254	ug/L	0.035	0.057	0.02	0.24	15	0
0890	Aroclor 1254	ug/L	0.035	0.057	0.02	0.25	16	0
4903	Aroclor 1254	ug/L	0.097	0.13	0.02	0.245	3	0
0560	Aroclor 1260	ug/L	0.245	-	0.245	0.245	1	0
0804	Aroclor 1260	ug/L	0.24	-	0.24	0.24	1	0
0807	Aroclor 1260	ug/L	0.036	0.058	0.02	0.255	16	0
0814	Aroclor 1260	ug/L	0.25	-	0.25	0.25	1	0
0817	Aroclor 1260	ug/L	0.034	0.055	0.02	0.24	16	0
0826	Aroclor 1260	ug/L	0.035	0.056	0.02	0.245	16	0
0829	Aroclor 1260	ug/L	0.25	-	0.25	0.25	1	0
0831	Aroclor 1260	ug/L	0.034	0.053	0.02	0.24	17	0
0832	Aroclor 1260	ug/L	0.25	-	0.25	0.25	1	0
0834	Aroclor 1260	ug/L	0.035	0.057	0.02	0.255	17	0
0840	Aroclor 1260	ug/L	0.035	0.056	0.02	0.245	16	0
0852	Aroclor 1260	ug/L	0.035	0.057	0.02	0.24	15	0
0890	Aroclor 1260	ug/L	0.035	0.057	0.02	0.25	16	0
4903	Aroclor 1260	ug/L	0.097	0.13	0.02	0.245	3	0
0804	Arsenic, Dissolved	mg/L	0.00074	0.000077	0.0006	0.00086	18	18
0807	Arsenic, Dissolved	mg/L	0.00069	0.000070	0.0006	0.00078	16	16
0814	Arsenic, Dissolved	mg/L	0.00068	0.000064	0.0006	0.00079	17	17
0817	Arsenic, Dissolved	mg/L	0.00069	0.000074	0.0006	0.00082	18	18
0826	Arsenic, Dissolved	mg/L	0.00065	0.000097	0.0003	0.00093	38	37
0829	Arsenic, Dissolved	mg/L	0.00064	0.000075	0.0005	0.00075	18	18
0831	Arsenic, Dissolved	mg/L	0.00062	0.00012	0.0003	0.00098	36	34
0832	Arsenic, Dissolved	mg/L	0.00069	0.000065	0.0006	0.00078	8	8
0834	Arsenic, Dissolved	mg/L	0.00073	0.00020	0.0006	0.00144	16	16
0840	Arsenic, Dissolved	mg/L	0.00065	0.000064	0.0005	0.00075	17	17
0852	Arsenic, Dissolved	mg/L	0.00067	0.000082	0.0005	0.00093	39	39
0890	Arsenic, Dissolved	mg/L	0.00066	0.00011	0.0003	0.00097	38	37
4903	Arsenic, Dissolved	mg/L	0.00068	0.000069	0.0006	0.00078	8	8
0560	Arsenic, Total	mg/L	0.00087	-	0.0009	0.00087	1	1
0804	Arsenic, Total	mg/L	0.00082	0.00011	0.0007	0.00105	19	19
0807	Arsenic, Total	mg/L	0.00076	0.000097	0.0006	0.001	17	17
0814	Arsenic, Total	mg/L	0.00074	0.00011	0.0007	0.0011	18	18
0817	Arsenic, Total	mg/L	0.00077	0.00014	0.0007	0.0013	19	19
0826	Arsenic, Total	mg/L	0.00074	0.000094	0.0006	0.0011	40	40
0829	Arsenic, Total	mg/L	0.00068	0.000072	0.0006	0.0008	19	19
0831	Arsenic, Total	mg/L	0.00070	0.000099	0.0005	0.001	38	38
0832	Arsenic, Total	mg/L	0.00078	0.00017	0.0007	0.0012	9	9
0834	Arsenic, Total	mg/L	0.00081	0.00038	0.0006	0.00224	17	17
0840	Arsenic, Total	mg/L	0.00075	0.00020	0.0006	0.00135	18	18
0852	Arsenic, Total	mg/L	0.00076	0.00014	0.0006	0.0014	41	41
0890	Arsenic, Total	mg/L	0.00074	0.00011	0.0006	0.0011	40	40
4903	Arsenic, Total	mg/L	0.00085	0.00025	0.0007	0.00133	9	9
0804	Barium, Dissolved	mg/L	0.0045	0.00042	0.004	0.00561	18	18

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	Barium, Dissolved	mg/L	0.0042	0.00030	0.0039	0.00492	16	16
0814	Barium, Dissolved	mg/L	0.0041	0.00017	0.0038	0.00437	17	17
0817	Barium, Dissolved	mg/L	0.0042	0.00019	0.004	0.00469	18	18
0826	Barium, Dissolved	mg/L	0.0043	0.00024	0.0038	0.00489	37	37
0829	Barium, Dissolved	mg/L	0.0038	0.00016	0.0035	0.00398	17	17
0831	Barium, Dissolved	mg/L	0.0038	0.00022	0.0033	0.00428	35	35
0832	Barium, Dissolved	mg/L	0.0040	0.00017	0.0037	0.00428	8	8
0834	Barium, Dissolved	mg/L	0.0043	0.0010	0.0036	0.00791	15	15
0840	Barium, Dissolved	mg/L	0.0038	0.00020	0.0035	0.00412	17	17
0852	Barium, Dissolved	mg/L	0.0042	0.00018	0.0038	0.00447	36	36
0890	Barium, Dissolved	mg/L	0.0040	0.00020	0.0037	0.00472	35	35
4903	Barium, Dissolved	mg/L	0.0041	0.00030	0.0038	0.00467	7	7
0560	Barium, Total	mg/L	0.00464	-	0.0046	0.00464	1	1
0804	Barium, Total	mg/L	0.0050	0.00081	0.0042	0.0073	17	17
0807	Barium, Total	mg/L	0.0045	0.00038	0.0041	0.00533	16	16
0814	Barium, Total	mg/L	0.0043	0.00037	0.004	0.00561	16	16
0817	Barium, Total	mg/L	0.0047	0.00068	0.0043	0.00713	17	17
0826	Barium, Total	mg/L	0.0050	0.0025	0.0042	0.02	38	38
0829	Barium, Total	mg/L	0.0041	0.00041	0.0037	0.0057	19	19
0831	Barium, Total	mg/L	0.0041	0.00036	0.0036	0.00574	38	38
0832	Barium, Total	mg/L	0.0048	0.0016	0.0039	0.00916	9	9
0834	Barium, Total	mg/L	0.0046	0.0016	0.0034	0.01	17	17
0840	Barium, Total	mg/L	0.0042	0.00045	0.0037	0.00584	18	18
0852	Barium, Total	mg/L	0.0046	0.00090	0.0039	0.01	41	41
0890	Barium, Total	mg/L	0.0047	0.0025	0.004	0.02	40	40
4903	Barium, Total	mg/L	0.0053	0.0019	0.0039	0.01	9	9
0560	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0804	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0807	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0814	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0817	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0826	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0829	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0831	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0832	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0834	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0840	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0852	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0890	Benzene	ug/L	0.5	-	0.5	0.5	1	0
4903	Benzene	ug/L	0.5	-	0.5	0.5	1	0
0560	Benzidine	ug/L	11.5	-	11.5	11.5	1	0
0804	Benzidine	ug/L	11.5	-	11.5	11.5	1	0
0807	Benzidine	ug/L	12	-	12	12	1	0
0814	Benzidine	ug/L	12	-	12	12	1	0
0817	Benzidine	ug/L	11.5	-	11.5	11.5	1	0
0826	Benzidine	ug/L	11.5	-	11.5	11.5	1	0
0829	Benzidine	ug/L	12	-	12	12	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0831	Benzidine	ug/L	11.5	-	11.5	11.5	1	0
0832	Benzidine	ug/L	12	-	12	12	1	0
0834	Benzidine	ug/L	12	-	12	12	1	0
0840	Benzidine	ug/L	11.5	-	11.5	11.5	1	0
0852	Benzidine	ug/L	11.5	-	11.5	11.5	1	0
0890	Benzidine	ug/L	12	-	12	12	1	0
4903	Benzidine	ug/L	11.5	-	11.5	11.5	1	0
0560	Benzo(a)anthracene	ug/L	0.29	-	0.29	0.29	1	0
0804	Benzo(a)anthracene	ug/L	0.285	-	0.285	0.285	1	0
0807	Benzo(a)anthracene	ug/L	0.026	0.074	0.005	0.305	16	0
0814	Benzo(a)anthracene	ug/L	0.3	-	0.3	0.3	1	0
0817	Benzo(a)anthracene	ug/L	0.025	0.069	0.005	0.285	16	0
0826	Benzo(a)anthracene	ug/L	0.026	0.071	0.005	0.29	16	0
0829	Benzo(a)anthracene	ug/L	0.3	-	0.3	0.3	1	0
0831	Benzo(a)anthracene	ug/L	0.024	0.067	0.005	0.285	17	0
0832	Benzo(a)anthracene	ug/L	0.3	-	0.3	0.3	1	0
0834	Benzo(a)anthracene	ug/L	0.025	0.072	0.005	0.305	17	0
0840	Benzo(a)anthracene	ug/L	0.026	0.071	0.005	0.29	16	0
0852	Benzo(a)anthracene	ug/L	0.026	0.072	0.005	0.285	15	0
0890	Benzo(a)anthracene	ug/L	0.026	0.073	0.005	0.3	16	0
4903	Benzo(a)anthracene	ug/L	0.1	0.16	0.005	0.29	3	0
0560	Benzo(a)pyrene	ug/L	0.485	-	0.485	0.485	1	0
0804	Benzo(a)pyrene	ug/L	0.475	-	0.475	0.475	1	0
0807	Benzo(a)pyrene	ug/L	0.035	0.12	0.0024	0.5	16	0
0814	Benzo(a)pyrene	ug/L	0.5	-	0.5	0.5	1	0
0817	Benzo(a)pyrene	ug/L	0.033	0.12	0.0024	0.475	16	0
0826	Benzo(a)pyrene	ug/L	0.034	0.12	0.0024	0.485	16	0
0829	Benzo(a)pyrene	ug/L	0.5	-	0.5	0.5	1	0
0831	Benzo(a)pyrene	ug/L	0.031	0.11	0.0024	0.475	17	0
0832	Benzo(a)pyrene	ug/L	0.5	-	0.5	0.5	1	0
0834	Benzo(a)pyrene	ug/L	0.033	0.12	0.0024	0.5	17	0
0840	Benzo(a)pyrene	ug/L	0.034	0.12	0.0024	0.485	16	0
0852	Benzo(a)pyrene	ug/L	0.037	0.12	0.0024	0.475	15	2
0890	Benzo(a)pyrene	ug/L	0.035	0.12	0.0024	0.5	16	0
4903	Benzo(a)pyrene	ug/L	0.16	0.28	0.0024	0.485	3	0
0560	Benzo(b)fluoranthene	ug/L	0.8	-	0.8	0.8	1	0
0804	Benzo(b)fluoranthene	ug/L	0.75	-	0.75	0.75	1	0
0807	Benzo(b)fluoranthene	ug/L	0.053	0.20	0.0024	0.8	16	0
0814	Benzo(b)fluoranthene	ug/L	0.8	-	0.8	0.8	1	0
0817	Benzo(b)fluoranthene	ug/L	0.050	0.19	0.0024	0.75	16	0
0826	Benzo(b)fluoranthene	ug/L	0.054	0.20	0.0024	0.8	16	0
0829	Benzo(b)fluoranthene	ug/L	0.8	-	0.8	0.8	1	0
0831	Benzo(b)fluoranthene	ug/L	0.048	0.18	0.0024	0.75	17	0
0832	Benzo(b)fluoranthene	ug/L	0.8	-	0.8	0.8	1	0
0834	Benzo(b)fluoranthene	ug/L	0.051	0.19	0.0024	0.8	17	0
0840	Benzo(b)fluoranthene	ug/L	0.054	0.20	0.0024	0.8	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0852	Benzo(b)fluoranthene	ug/L	0.059	0.20	0.0024	0.75	14	1
0890	Benzo(b)fluoranthene	ug/L	0.053	0.20	0.0024	0.8	16	0
4903	Benzo(b)fluoranthene	ug/L	0.27	0.46	0.0024	0.8	3	0
0560	Benzo(g,h,i)perylene	ug/L	0.485	-	0.485	0.485	1	0
0804	Benzo(g,h,i)perylene	ug/L	0.475	-	0.475	0.475	1	0
0807	Benzo(g,h,i)perylene	ug/L	0.046	0.12	0.01	0.5	16	0
0814	Benzo(g,h,i)perylene	ug/L	0.5	-	0.5	0.5	1	0
0817	Benzo(g,h,i)perylene	ug/L	0.046	0.12	0.01	0.475	15	0
0826	Benzo(g,h,i)perylene	ug/L	0.045	0.12	0.01	0.485	16	0
0829	Benzo(g,h,i)perylene	ug/L	0.5	-	0.5	0.5	1	0
0831	Benzo(g,h,i)perylene	ug/L	0.048	0.11	0.01	0.475	16	1
0832	Benzo(g,h,i)perylene	ug/L	0.5	-	0.5	0.5	1	0
0834	Benzo(g,h,i)perylene	ug/L	0.044	0.12	0.01	0.5	17	0
0840	Benzo(g,h,i)perylene	ug/L	0.046	0.12	0.01	0.485	16	0
0852	Benzo(g,h,i)perylene	ug/L	0.052	0.13	0.01	0.475	13	0
0890	Benzo(g,h,i)perylene	ug/L	0.051	0.13	0.01	0.5	14	0
4903	Benzo(g,h,i)perylene	ug/L	0.17	0.27	0.01	0.485	3	0
0560	Benzo(k)fluoranthene	ug/L	0.8	-	0.8	0.8	1	0
0804	Benzo(k)fluoranthene	ug/L	0.75	-	0.75	0.75	1	0
0807	Benzo(k)fluoranthene	ug/L	0.053	0.20	0.0024	0.8	16	0
0814	Benzo(k)fluoranthene	ug/L	0.8	-	0.8	0.8	1	0
0817	Benzo(k)fluoranthene	ug/L	0.050	0.19	0.0024	0.75	16	0
0826	Benzo(k)fluoranthene	ug/L	0.054	0.20	0.0024	0.8	16	0
0829	Benzo(k)fluoranthene	ug/L	0.8	-	0.8	0.8	1	0
0831	Benzo(k)fluoranthene	ug/L	0.048	0.18	0.0024	0.75	17	0
0832	Benzo(k)fluoranthene	ug/L	0.8	-	0.8	0.8	1	0
0834	Benzo(k)fluoranthene	ug/L	0.051	0.19	0.0024	0.8	17	0
0840	Benzo(k)fluoranthene	ug/L	0.054	0.20	0.0024	0.8	16	0
0852	Benzo(k)fluoranthene	ug/L	0.057	0.20	0.0024	0.75	14	1
0890	Benzo(k)fluoranthene	ug/L	0.053	0.20	0.0024	0.8	16	0
4903	Benzo(k)fluoranthene	ug/L	0.27	0.46	0.0024	0.8	3	0
0560	Benzoic Acid	ug/L	1.95	-	1.95	1.95	1	0
0804	Benzoic Acid	ug/L	1.9	-	1.9	1.9	1	0
0807	Benzoic Acid	ug/L	2.05	-	2.05	2.05	1	0
0814	Benzoic Acid	ug/L	2	-	2	2	1	0
0817	Benzoic Acid	ug/L	1.9	-	1.9	1.9	1	0
0826	Benzoic Acid	ug/L	1.95	-	1.95	1.95	1	0
0829	Benzoic Acid	ug/L	2	-	2	2	1	0
0831	Benzoic Acid	ug/L	1.9	-	1.9	1.9	1	0
0832	Benzoic Acid	ug/L	2	-	2	2	1	0
0834	Benzoic Acid	ug/L	2.05	-	2.05	2.05	1	0
0840	Benzoic Acid	ug/L	1.95	-	1.95	1.95	1	0
0852	Benzoic Acid	ug/L	1.9	-	1.9	1.9	1	0
0890	Benzoic Acid	ug/L	2	-	2	2	1	0
4903	Benzoic Acid	ug/L	1.95	-	1.95	1.95	1	0
0560	Benzyl Alcohol	ug/L	0.485	-	0.485	0.485	1	0
0804	Benzyl Alcohol	ug/L	0.475	-	0.475	0.475	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	Benzyl Alcohol	ug/L	0.5	-	0.5	0.5	1	0
0814	Benzyl Alcohol	ug/L	0.5	-	0.5	0.5	1	0
0817	Benzyl Alcohol	ug/L	0.475	-	0.475	0.475	1	0
0826	Benzyl Alcohol	ug/L	0.485	-	0.485	0.485	1	0
0829	Benzyl Alcohol	ug/L	0.5	-	0.5	0.5	1	0
0831	Benzyl Alcohol	ug/L	0.475	-	0.475	0.475	1	0
0832	Benzyl Alcohol	ug/L	0.5	-	0.5	0.5	1	0
0834	Benzyl Alcohol	ug/L	0.5	-	0.5	0.5	1	0
0840	Benzyl Alcohol	ug/L	0.485	-	0.485	0.485	1	0
0852	Benzyl Alcohol	ug/L	0.475	-	0.475	0.475	1	0
0890	Benzyl Alcohol	ug/L	0.5	-	0.5	0.5	1	0
4903	Benzyl Alcohol	ug/L	0.485	-	0.485	0.485	1	0
0560	Benzyl Butyl Phthalate	ug/L	0.29	-	0.29	0.29	1	0
0804	Benzyl Butyl Phthalate	ug/L	0.285	-	0.285	0.285	1	0
0807	Benzyl Butyl Phthalate	ug/L	0.15	0.21	0.0024	0.305	2	0
0814	Benzyl Butyl Phthalate	ug/L	0.3	-	0.3	0.3	1	0
0817	Benzyl Butyl Phthalate	ug/L	0.285	-	0.285	0.285	1	0
0826	Benzyl Butyl Phthalate	ug/L	0.29	-	0.29	0.29	1	0
0829	Benzyl Butyl Phthalate	ug/L	0.3	-	0.3	0.3	1	0
0831	Benzyl Butyl Phthalate	ug/L	0.285	-	0.285	0.285	1	0
0832	Benzyl Butyl Phthalate	ug/L	0.3	-	0.3	0.3	1	0
0834	Benzyl Butyl Phthalate	ug/L	0.15	0.21	0.0024	0.305	2	0
0840	Benzyl Butyl Phthalate	ug/L	0.15	0.20	0.0047	0.29	2	0
0852	Benzyl Butyl Phthalate	ug/L	0.285	-	0.285	0.285	1	0
0890	Benzyl Butyl Phthalate	ug/L	0.3	-	0.3	0.3	1	0
4903	Benzyl Butyl Phthalate	ug/L	0.29	-	0.29	0.29	1	0
0804	Beryllium, Dissolved	mg/L	0.000025	6.6E-13	3E-05	2.5E-05	18	0
0807	Beryllium, Dissolved	mg/L	0.000025	6.6E-13	3E-05	2.5E-05	16	0
0814	Beryllium, Dissolved	mg/L	0.000025	7.0E-13	3E-05	2.5E-05	17	0
0817	Beryllium, Dissolved	mg/L	0.000025	6.6E-13	3E-05	2.5E-05	18	0
0826	Beryllium, Dissolved	mg/L	0.000064	0.000038	3E-05	0.0001	38	0
0829	Beryllium, Dissolved	mg/L	0.000025	6.6E-13	3E-05	2.5E-05	18	0
0831	Beryllium, Dissolved	mg/L	0.000067	0.000038	3E-05	0.0001	36	0
0832	Beryllium, Dissolved	mg/L	0.000025	4.9E-13	3E-05	2.5E-05	8	0
0834	Beryllium, Dissolved	mg/L	0.000027	0.0000062	3E-05	0.00005	16	0
0840	Beryllium, Dissolved	mg/L	0.000025	7.0E-13	3E-05	2.5E-05	17	0
0852	Beryllium, Dissolved	mg/L	0.000063	0.000038	3E-05	0.0001	39	0
0890	Beryllium, Dissolved	mg/L	0.000064	0.000038	3E-05	0.0001	38	0
4903	Beryllium, Dissolved	mg/L	0.000025	4.9E-13	3E-05	2.5E-05	8	0
0560	Beryllium, Total	mg/L	0.00025	-	0.0003	0.00025	1	0
0804	Beryllium, Total	mg/L	0.000037	0.000052	3E-05	0.00025	19	0
0807	Beryllium, Total	mg/L	0.000038	0.000055	3E-05	0.00025	17	0
0814	Beryllium, Total	mg/L	0.000038	0.000053	3E-05	0.00025	18	0
0817	Beryllium, Total	mg/L	0.000037	0.000052	3E-05	0.00025	19	0
0826	Beryllium, Total	mg/L	0.000070	0.000047	3E-05	0.00025	40	0
0829	Beryllium, Total	mg/L	0.000037	0.000052	3E-05	0.00025	19	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0831	Beryllium, Total	mg/L	0.000072	0.000048	3E-05	0.00025	38	0
0832	Beryllium, Total	mg/L	0.000050	0.000075	3E-05	0.00025	9	0
0834	Beryllium, Total	mg/L	0.000038	0.000055	3E-05	0.00025	17	0
0840	Beryllium, Total	mg/L	0.000038	0.000053	3E-05	0.00025	18	0
0852	Beryllium, Total	mg/L	0.000069	0.000047	3E-05	0.00025	41	0
0890	Beryllium, Total	mg/L	0.000080	0.000082	3E-05	0.0005	41	0
4903	Beryllium, Total	mg/L	0.000050	0.000075	3E-05	0.00025	9	0
0560	Beta-BHC	ug/L	0.02	-	0.02	0.02	1	0
0804	Beta-BHC	ug/L	0.02	-	0.02	0.02	1	0
0807	Beta-BHC	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Beta-BHC	ug/L	0.025	-	0.025	0.025	1	0
0817	Beta-BHC	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Beta-BHC	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Beta-BHC	ug/L	0.025	-	0.025	0.025	1	0
0831	Beta-BHC	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Beta-BHC	ug/L	0.025	-	0.025	0.025	1	0
0834	Beta-BHC	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Beta-BHC	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Beta-BHC	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Beta-BHC	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Beta-BHC	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Bis(2-Chloroethoxy)Methane	ug/L	0.485	-	0.485	0.485	1	0
0804	Bis(2-Chloroethoxy)Methane	ug/L	0.475	-	0.475	0.475	1	0
0807	Bis(2-Chloroethoxy)Methane	ug/L	0.035	0.12	0.0024	0.5	16	0
0814	Bis(2-Chloroethoxy)Methane	ug/L	0.5	-	0.5	0.5	1	0
0817	Bis(2-Chloroethoxy)Methane	ug/L	0.033	0.12	0.0024	0.475	16	0
0826	Bis(2-Chloroethoxy)Methane	ug/L	0.034	0.12	0.0024	0.485	16	0
0829	Bis(2-Chloroethoxy)Methane	ug/L	0.5	-	0.5	0.5	1	0
0831	Bis(2-Chloroethoxy)Methane	ug/L	0.031	0.11	0.0024	0.475	17	0
0832	Bis(2-Chloroethoxy)Methane	ug/L	0.5	-	0.5	0.5	1	0
0834	Bis(2-Chloroethoxy)Methane	ug/L	0.033	0.12	0.0024	0.5	17	0
0840	Bis(2-Chloroethoxy)Methane	ug/L	0.034	0.12	0.0024	0.485	16	0
0852	Bis(2-Chloroethoxy)Methane	ug/L	0.035	0.12	0.0024	0.475	15	0
0890	Bis(2-Chloroethoxy)Methane	ug/L	0.035	0.12	0.0024	0.5	16	0
4903	Bis(2-Chloroethoxy)Methane	ug/L	0.16	0.28	0.0024	0.485	3	0
0560	Bis(2-Chloroethyl)Ether	ug/L	0.29	-	0.29	0.29	1	0
0804	Bis(2-Chloroethyl)Ether	ug/L	0.285	-	0.285	0.285	1	0
0807	Bis(2-Chloroethyl)Ether	ug/L	0.022	0.075	0.0024	0.305	16	0
0814	Bis(2-Chloroethyl)Ether	ug/L	0.3	-	0.3	0.3	1	0
0817	Bis(2-Chloroethyl)Ether	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	Bis(2-Chloroethyl)Ether	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	Bis(2-Chloroethyl)Ether	ug/L	0.3	-	0.3	0.3	1	0
0831	Bis(2-Chloroethyl)Ether	ug/L	0.020	0.068	0.0024	0.285	17	0
0832	Bis(2-Chloroethyl)Ether	ug/L	0.3	-	0.3	0.3	1	0
0834	Bis(2-Chloroethyl)Ether	ug/L	0.021	0.073	0.0024	0.305	17	0
0840	Bis(2-Chloroethyl)Ether	ug/L	0.022	0.072	0.0024	0.29	16	0
0852	Bis(2-Chloroethyl)Ether	ug/L	0.022	0.073	0.0024	0.285	15	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0890	Bis(2-Chloroethyl)Ether	ug/L	0.022	0.074	0.0024	0.3	16	0
4903	Bis(2-Chloroethyl)Ether	ug/L	0.098	0.17	0.0024	0.29	3	0
0560	Bis(2-Chloroisopropyl)Ether	ug/L	0.95	-	0.95	0.95	1	0
0804	Bis(2-Chloroisopropyl)Ether	ug/L	0.95	-	0.95	0.95	1	0
0807	Bis(2-Chloroisopropyl)Ether	ug/L	0.066	0.25	0.0024	1	16	0
0814	Bis(2-Chloroisopropyl)Ether	ug/L	1	-	1	1	1	0
0817	Bis(2-Chloroisopropyl)Ether	ug/L	0.063	0.24	0.0024	0.95	16	0
0826	Bis(2-Chloroisopropyl)Ether	ug/L	0.063	0.24	0.0024	0.95	16	0
0829	Bis(2-Chloroisopropyl)Ether	ug/L	1	-	1	1	1	0
0831	Bis(2-Chloroisopropyl)Ether	ug/L	0.059	0.23	0.0024	0.95	17	0
0832	Bis(2-Chloroisopropyl)Ether	ug/L	1	-	1	1	1	0
0834	Bis(2-Chloroisopropyl)Ether	ug/L	0.062	0.24	0.0024	1	17	0
0840	Bis(2-Chloroisopropyl)Ether	ug/L	0.063	0.24	0.0024	0.95	16	0
0852	Bis(2-Chloroisopropyl)Ether	ug/L	0.067	0.24	0.0024	0.95	15	0
0890	Bis(2-Chloroisopropyl)Ether	ug/L	0.066	0.25	0.0024	1	16	0
4903	Bis(2-Chloroisopropyl)Ether	ug/L	0.32	0.55	0.0024	0.95	3	0
0560	Bis(2-Ethylhexyl)Phthalate	ug/L	0.29	-	0.29	0.29	1	0
0804	Bis(2-Ethylhexyl)Phthalate	ug/L	0.285	-	0.285	0.285	1	0
0807	Bis(2-Ethylhexyl)Phthalate	ug/L	26.7	41.0	5.98	88.1	4	4
0814	Bis(2-Ethylhexyl)Phthalate	ug/L	0.3	-	0.3	0.3	1	0
0817	Bis(2-Ethylhexyl)Phthalate	ug/L	0.285	-	0.285	0.285	1	0
0826	Bis(2-Ethylhexyl)Phthalate	ug/L	2.7	2.1	0.29	4.07	3	2
0829	Bis(2-Ethylhexyl)Phthalate	ug/L	10.6	-	10.6	10.6	1	1
0831	Bis(2-Ethylhexyl)Phthalate	ug/L	6.9	0.014	6.89	6.91	2	2
0832	Bis(2-Ethylhexyl)Phthalate	ug/L	0.3	-	0.3	0.3	1	0
0834	Bis(2-Ethylhexyl)Phthalate	ug/L	3.2	4.1	0.305	6.08	2	1
0840	Bis(2-Ethylhexyl)Phthalate	ug/L	1.9	2.3	0.29	3.58	2	1
0852	Bis(2-Ethylhexyl)Phthalate	ug/L	10.3	11.7	0.285	23.1	3	2
0890	Bis(2-Ethylhexyl)Phthalate	ug/L	3.53	-	3.53	3.53	1	1
4903	Bis(2-Ethylhexyl)Phthalate	ug/L	11.8	16.3	0.29	23.3	2	1
0560	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0804	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0807	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0814	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0817	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0826	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0829	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0831	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0832	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0834	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0840	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0852	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0890	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
4903	Bromodichloromethane	ug/L	0.5	-	0.5	0.5	1	0
0560	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0804	Bromoform	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0814	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0817	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0826	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0829	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0831	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0832	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0834	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0840	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0852	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0890	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
4903	Bromoform	ug/L	0.5	-	0.5	0.5	1	0
0560	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0804	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0807	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0814	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0817	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0826	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0829	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0831	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0832	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0834	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0840	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0852	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0890	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
4903	Bromomethane	ug/L	0.5	-	0.5	0.5	1	0
0804	Cadmium, Dissolved	mg/L	0.000005	7.4E-14	5E-06	5E-06	18	0
0807	Cadmium, Dissolved	mg/L	0.000005	5.9E-14	5E-06	5E-06	16	0
0814	Cadmium, Dissolved	mg/L	0.000005	7.8E-14	5E-06	5E-06	17	0
0817	Cadmium, Dissolved	mg/L	0.000005	7.4E-14	5E-06	5E-06	18	0
0826	Cadmium, Dissolved	mg/L	0.000029	0.000023	5E-06	0.00005	38	0
0829	Cadmium, Dissolved	mg/L	0.000005	7.4E-14	5E-06	5E-06	18	0
0831	Cadmium, Dissolved	mg/L	0.000030	0.000023	5E-06	0.00005	36	0
0832	Cadmium, Dissolved	mg/L	0.000005	6.1E-14	5E-06	5E-06	8	0
0834	Cadmium, Dissolved	mg/L	0.0000053	0.0000013	5E-06	0.00001	16	0
0840	Cadmium, Dissolved	mg/L	0.000005	7.8E-14	5E-06	5E-06	17	0
0852	Cadmium, Dissolved	mg/L	0.000028	0.000023	5E-06	0.00005	39	0
0890	Cadmium, Dissolved	mg/L	0.000029	0.000023	5E-06	0.00005	38	0
4903	Cadmium, Dissolved	mg/L	0.000005	6.1E-14	5E-06	5E-06	8	0
0560	Cadmium, Total	mg/L	0.0001	-	0.0001	0.0001	1	0
0804	Cadmium, Total	mg/L	0.000011	0.000022	5E-06	0.0001	19	1
0807	Cadmium, Total	mg/L	0.000011	0.000023	5E-06	0.0001	17	0
0814	Cadmium, Total	mg/L	0.000010	0.000022	5E-06	0.0001	18	0
0817	Cadmium, Total	mg/L	0.00001	0.000022	5E-06	0.0001	19	0
0826	Cadmium, Total	mg/L	0.000031	0.000025	5E-06	0.0001	40	0
0829	Cadmium, Total	mg/L	0.00001	0.000022	5E-06	0.0001	19	0
0831	Cadmium, Total	mg/L	0.000033	0.000025	5E-06	0.0001	38	1

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0832	Cadmium, Total	mg/L	0.000016	0.000032	5E-06	0.0001	9	0
0834	Cadmium, Total	mg/L	0.000013	0.000024	5E-06	0.0001	17	1
0840	Cadmium, Total	mg/L	0.000010	0.000022	5E-06	0.0001	18	0
0852	Cadmium, Total	mg/L	0.000030	0.000025	5E-06	0.0001	41	0
0890	Cadmium, Total	mg/L	0.000067	0.00023	5E-06	0.0015	41	0
4903	Cadmium, Total	mg/L	0.000033	0.000056	5E-06	0.00016	9	2
0804	Calcium, Dissolved	mg/L	9.5	0.63	8.94	11.5	18	18
0807	Calcium, Dissolved	mg/L	9.2	0.35	8.63	10	16	16
0814	Calcium, Dissolved	mg/L	9.1	0.28	8.56	9.49	17	17
0817	Calcium, Dissolved	mg/L	9.3	0.23	8.95	9.64	18	18
0826	Calcium, Dissolved	mg/L	9.1	0.28	8.48	9.65	39	39
0829	Calcium, Dissolved	mg/L	9.0	0.29	8.66	9.64	18	18
0831	Calcium, Dissolved	mg/L	8.8	0.32	7.76	9.37	37	37
0832	Calcium, Dissolved	mg/L	9.2	0.32	8.8	9.71	8	8
0834	Calcium, Dissolved	mg/L	9.0	0.26	8.57	9.37	16	16
0840	Calcium, Dissolved	mg/L	9.0	0.22	8.74	9.46	17	17
0852	Calcium, Dissolved	mg/L	9.1	0.27	8.59	9.71	40	40
0890	Calcium, Dissolved	mg/L	9.0	0.28	8.42	9.68	39	39
4903	Calcium, Dissolved	mg/L	9.2	0.32	8.78	9.68	8	8
0560	Calcium, Total	mg/L	9.8	-	9.8	9.8	1	1
0804	Calcium, Total	mg/L	9.5	0.51	8.83	10.9	19	19
0807	Calcium, Total	mg/L	9.2	0.49	8.29	10.4	17	17
0814	Calcium, Total	mg/L	9.2	0.44	8.27	9.82	18	18
0817	Calcium, Total	mg/L	9.3	0.37	8.61	9.91	19	19
0826	Calcium, Total	mg/L	9.1	0.38	8.38	9.96	40	40
0829	Calcium, Total	mg/L	8.9	0.33	8.15	9.4	19	19
0831	Calcium, Total	mg/L	8.8	0.41	7.76	9.34	38	38
0832	Calcium, Total	mg/L	9.3	0.59	8.48	10.5	9	9
0834	Calcium, Total	mg/L	9.1	0.42	8.55	10.1	17	17
0840	Calcium, Total	mg/L	9.0	0.35	8.46	9.48	18	18
0852	Calcium, Total	mg/L	9.1	0.40	8.27	10	41	41
0890	Calcium, Total	mg/L	9.0	0.40	8.14	9.75	40	40
4903	Calcium, Total	mg/L	9.3	0.42	8.59	9.95	9	9
0560	Carbazole	ug/L	0.485	-	0.485	0.485	1	0
0804	Carbazole	ug/L	0.475	-	0.475	0.475	1	0
0807	Carbazole	ug/L	0.038	0.12	0.005	0.5	16	0
0814	Carbazole	ug/L	0.5	-	0.5	0.5	1	0
0817	Carbazole	ug/L	0.037	0.12	0.005	0.475	16	0
0826	Carbazole	ug/L	0.038	0.12	0.005	0.485	16	0
0829	Carbazole	ug/L	0.5	-	0.5	0.5	1	0
0831	Carbazole	ug/L	0.035	0.11	0.005	0.475	17	0
0832	Carbazole	ug/L	0.5	-	0.5	0.5	1	0
0834	Carbazole	ug/L	0.037	0.12	0.005	0.5	17	0
0840	Carbazole	ug/L	0.038	0.12	0.005	0.485	16	0
0852	Carbazole	ug/L	0.039	0.12	0.005	0.475	15	0
0890	Carbazole	ug/L	0.038	0.12	0.005	0.5	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
4903	Carbazole	ug/L	0.17	0.28	0.005	0.485	3	0
0560	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0804	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0807	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0814	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0817	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0826	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0829	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0831	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0832	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0834	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0840	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0852	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0890	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
4903	Carbon Disulfide	ug/L	0.5	-	0.5	0.5	1	0
0560	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0804	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0807	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0814	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0817	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0826	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0829	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0831	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0832	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0834	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0840	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0852	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0890	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
4903	Carbon Tetrachloride	ug/L	0.5	-	0.5	0.5	1	0
0560	Chlordane	ug/L	0.12	-	0.12	0.12	1	0
0804	Chlordane	ug/L	0.12	-	0.12	0.12	1	0
0807	Chlordane	ug/L	0.018	0.030	0.01	0.13	16	0
0814	Chlordane	ug/L	0.125	-	0.125	0.125	1	0
0817	Chlordane	ug/L	0.017	0.028	0.01	0.12	16	0
0826	Chlordane	ug/L	0.017	0.028	0.01	0.12	16	0
0829	Chlordane	ug/L	0.125	-	0.125	0.125	1	0
0831	Chlordane	ug/L	0.016	0.027	0.01	0.12	17	0
0832	Chlordane	ug/L	0.125	-	0.125	0.125	1	0
0834	Chlordane	ug/L	0.017	0.029	0.01	0.13	17	0
0840	Chlordane	ug/L	0.017	0.028	0.01	0.12	16	0
0852	Chlordane	ug/L	0.017	0.028	0.01	0.12	15	0
0890	Chlordane	ug/L	0.017	0.029	0.01	0.125	16	0
4903	Chlordane	ug/L	0.047	0.064	0.01	0.12	3	0
0560	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0804	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0807	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0814	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0817	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0826	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0829	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0831	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0832	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0834	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0840	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0852	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0890	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
4903	Chlorobenzene	ug/L	0.5	-	0.5	0.5	1	0
0560	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0804	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0807	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0814	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0817	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0826	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0829	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0831	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0832	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0834	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0840	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0852	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0890	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
4903	Chlorodibromomethane	ug/L	0.5	-	0.5	0.5	1	0
0560	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0804	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0807	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0814	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0817	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0826	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0829	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0831	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0832	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0834	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0840	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0852	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0890	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
4903	Chloroethane	ug/L	0.5	-	0.5	0.5	1	0
0560	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0804	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0807	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0814	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0817	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0826	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0829	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0831	Chloroform	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0832	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0834	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0840	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0852	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0890	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
4903	Chloroform	ug/L	0.5	-	0.5	0.5	1	0
0560	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0804	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0807	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0814	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0817	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0826	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0829	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0831	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0832	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0834	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0840	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0852	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0890	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
4903	Chloromethane	ug/L	0.5	-	0.5	0.5	1	0
0807	Chlorpyrifos	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0817	Chlorpyrifos	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0826	Chlorpyrifos	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0831	Chlorpyrifos	ug/L	0.015	4.5E-10	0.015	0.015	16	0
0834	Chlorpyrifos	ug/L	0.015	4.5E-10	0.015	0.015	16	0
0840	Chlorpyrifos	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0852	Chlorpyrifos	ug/L	0.015	4.4E-10	0.015	0.015	14	0
0890	Chlorpyrifos	ug/L	0.015	4.5E-10	0.015	0.015	15	0
4903	Chlorpyrifos	ug/L	0.015	0	0.015	0.015	2	0
0804	Chromium, Dissolved	mg/L	0.00017	0.000071	0.0001	0.00039	12	12
0807	Chromium, Dissolved	mg/L	0.00014	0.000015	0.0001	0.00017	12	12
0814	Chromium, Dissolved	mg/L	0.00013	0.0000097	0.0001	0.00015	13	13
0817	Chromium, Dissolved	mg/L	0.00014	0.0000100	0.0001	0.00016	14	14
0826	Chromium, Dissolved	mg/L	0.00018	0.000062	0.0001	0.00048	34	15
0829	Chromium, Dissolved	mg/L	0.00013	0.000013	0.0001	0.00016	18	18
0831	Chromium, Dissolved	mg/L	0.00017	0.000059	0.0001	0.00043	36	17
0832	Chromium, Dissolved	mg/L	0.00013	0.000015	0.0001	0.00015	8	8
0834	Chromium, Dissolved	mg/L	0.00015	0.000035	0.0001	0.00026	16	16
0840	Chromium, Dissolved	mg/L	0.00013	0.000030	0.0001	0.00023	17	17
0852	Chromium, Dissolved	mg/L	0.00017	0.000055	0.0001	0.00041	37	18
0890	Chromium, Dissolved	mg/L	0.00018	0.000072	0.0001	0.00049	38	19
4903	Chromium, Dissolved	mg/L	0.00013	0.000016	0.0001	0.00015	8	8
0560	Chromium, Total	mg/L	0.00025	-	0.0003	0.00025	1	0
0804	Chromium, Total	mg/L	0.00023	0.00013	0.0001	0.00067	19	18
0807	Chromium, Total	mg/L	0.00018	0.000056	0.0001	0.00025	17	16
0814	Chromium, Total	mg/L	0.00015	0.000034	0.0001	0.00025	18	17
0817	Chromium, Total	mg/L	0.00023	0.00016	0.0001	0.00088	19	19

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0826	Chromium, Total	mg/L	0.00019	0.000059	0.0001	0.00048	40	19
0829	Chromium, Total	mg/L	0.00019	0.00010	0.0001	0.0006	19	19
0831	Chromium, Total	mg/L	0.00020	0.000081	0.0001	0.00059	38	18
0832	Chromium, Total	mg/L	0.00024	0.00018	0.0001	0.00071	9	9
0834	Chromium, Total	mg/L	0.00036	0.00062	0.0001	0.00258	17	17
0840	Chromium, Total	mg/L	0.00017	0.000041	7E-05	0.00025	18	17
0852	Chromium, Total	mg/L	0.00020	0.000046	0.0001	0.00043	41	20
0890	Chromium, Total	mg/L	0.00026	0.00036	0.0001	0.0025	41	19
4903	Chromium, Total	mg/L	0.00051	0.00084	0.0001	0.00273	9	8
0560	Chrysene	ug/L	0.29	-	0.29	0.29	1	0
0804	Chrysene	ug/L	0.285	-	0.285	0.285	1	0
0807	Chrysene	ug/L	0.026	0.074	0.005	0.305	16	0
0814	Chrysene	ug/L	0.3	-	0.3	0.3	1	0
0817	Chrysene	ug/L	0.025	0.069	0.005	0.285	16	0
0826	Chrysene	ug/L	0.026	0.071	0.005	0.29	16	0
0829	Chrysene	ug/L	0.3	-	0.3	0.3	1	0
0831	Chrysene	ug/L	0.024	0.067	0.005	0.285	17	0
0832	Chrysene	ug/L	0.3	-	0.3	0.3	1	0
0834	Chrysene	ug/L	0.025	0.072	0.005	0.305	17	0
0840	Chrysene	ug/L	0.026	0.071	0.005	0.29	16	0
0852	Chrysene	ug/L	0.027	0.071	0.005	0.285	15	1
0890	Chrysene	ug/L	0.026	0.073	0.005	0.3	16	0
4903	Chrysene	ug/L	0.1	0.16	0.005	0.29	3	0
0560	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0804	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0807	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0814	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0817	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0826	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0829	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0831	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0832	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0834	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0840	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0852	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0890	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
4903	Cis-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0804	Cobalt, Dissolved	mg/L	0.000022	0.0000088	2E-05	4.7E-05	18	18
0807	Cobalt, Dissolved	mg/L	0.000016	0.0000022	1E-05	2.1E-05	16	16
0814	Cobalt, Dissolved	mg/L	0.000016	0.0000014	1E-05	1.9E-05	17	17
0817	Cobalt, Dissolved	mg/L	0.000017	0.0000024	1E-05	2.2E-05	18	18
0826	Cobalt, Dissolved	mg/L	0.000059	0.000043	1E-05	0.0001	37	18
0829	Cobalt, Dissolved	mg/L	0.000015	0.0000012	1E-05	1.8E-05	18	18
0831	Cobalt, Dissolved	mg/L	0.000061	0.000043	1E-05	0.0001	35	16
0832	Cobalt, Dissolved	mg/L	0.0000165	0.0000027	1E-05	2.2E-05	8	8
0834	Cobalt, Dissolved	mg/L	0.000017	0.0000048	1E-05	3.3E-05	16	16

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0840	Cobalt, Dissolved	mg/L	0.000015	0.0000011	1E-05	1.7E-05	17	17
0852	Cobalt, Dissolved	mg/L	0.000057	0.000043	1E-05	0.0001	38	19
0890	Cobalt, Dissolved	mg/L	0.000058	0.000043	1E-05	0.0001	37	18
4903	Cobalt, Dissolved	mg/L	0.000019	0.0000026	1E-05	2.3E-05	8	8
0560	Cobalt, Total	mg/L	0.00025	-	0.0003	0.00025	1	0
0804	Cobalt, Total	mg/L	0.000052	0.000055	2E-05	0.00025	19	18
0807	Cobalt, Total	mg/L	0.000040	0.000055	2E-05	0.00025	17	16
0814	Cobalt, Total	mg/L	0.000035	0.000054	2E-05	0.00025	18	17
0817	Cobalt, Total	mg/L	0.00015	0.00048	2E-05	0.00214	19	18
0826	Cobalt, Total	mg/L	0.000069	0.000048	2E-05	0.00025	40	18
0829	Cobalt, Total	mg/L	0.000036	0.000052	2E-05	0.00025	19	18
0831	Cobalt, Total	mg/L	0.000072	0.000048	2E-05	0.00025	38	16
0832	Cobalt, Total	mg/L	0.000052	0.000074	2E-05	0.00025	9	8
0834	Cobalt, Total	mg/L	0.000064	0.00013	2E-05	0.00056	17	17
0840	Cobalt, Total	mg/L	0.000040	0.000053	2E-05	0.00025	18	17
0852	Cobalt, Total	mg/L	0.000068	0.000048	2E-05	0.00025	41	19
0890	Cobalt, Total	mg/L	0.000070	0.000048	2E-05	0.00025	40	18
4903	Cobalt, Total	mg/L	0.00012	0.00019	2E-05	0.00059	9	8
0804	Copper, Dissolved	mg/L	0.00095	0.00010	0.0009	0.00115	13	13
0807	Copper, Dissolved	mg/L	0.00093	0.000043	0.0009	0.00099	12	12
0814	Copper, Dissolved	mg/L	0.00094	0.000063	0.0009	0.00106	12	12
0817	Copper, Dissolved	mg/L	0.00092	0.000045	0.0009	0.00103	13	13
0826	Copper, Dissolved	mg/L	0.00099	0.00015	0.0008	0.0014	34	34
0829	Copper, Dissolved	mg/L	0.00086	0.000043	0.0007	0.00091	16	16
0831	Copper, Dissolved	mg/L	0.00091	0.00012	0.0007	0.0014	34	34
0832	Copper, Dissolved	mg/L	0.00093	0.000056	0.0008	0.00099	8	8
0834	Copper, Dissolved	mg/L	0.0011	0.00028	0.0009	0.00201	16	16
0840	Copper, Dissolved	mg/L	0.00086	0.000085	0.0007	0.00101	17	17
0852	Copper, Dissolved	mg/L	0.00096	0.00011	0.0008	0.0012	36	36
0890	Copper, Dissolved	mg/L	0.00096	0.00014	0.0008	0.0015	35	35
4903	Copper, Dissolved	mg/L	0.0013	0.00041	0.001	0.00205	7	7
0560	Copper, Total	mg/L	0.0016	-	0.0016	0.0016	1	1
0804	Copper, Total	mg/L	0.0011	0.00014	0.001	0.0015	19	19
0807	Copper, Total	mg/L	0.0011	0.00020	0.001	0.0018	17	17
0814	Copper, Total	mg/L	0.0011	0.00012	0.001	0.0015	18	18
0817	Copper, Total	mg/L	0.0012	0.00033	0.001	0.00232	19	19
0826	Copper, Total	mg/L	0.0011	0.00017	0.0009	0.0016	40	40
0829	Copper, Total	mg/L	0.0010	0.00021	0.0008	0.0018	19	19
0831	Copper, Total	mg/L	0.0010	0.00014	0.0009	0.0016	38	38
0832	Copper, Total	mg/L	0.0012	0.00051	0.0009	0.00257	9	9
0834	Copper, Total	mg/L	0.0014	0.0013	0.0009	0.00635	17	17
0840	Copper, Total	mg/L	0.00099	0.00013	0.0008	0.0014	18	18
0852	Copper, Total	mg/L	0.0011	0.00012	0.001	0.0015	41	41
0890	Copper, Total	mg/L	0.0011	0.00030	0.0009	0.00259	41	40
4903	Copper, Total	mg/L	0.0023	0.0020	0.001	0.00733	9	9
0560	Coprostanol	ug/L	1.95	-	1.95	1.95	1	0
0804	Coprostanol	ug/L	1.9	-	1.9	1.9	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	Coprostanol	ug/L	2.05	-	2.05	2.05	1	0
0814	Coprostanol	ug/L	2	-	2	2	1	0
0817	Coprostanol	ug/L	1.9	-	1.9	1.9	1	0
0826	Coprostanol	ug/L	1.95	-	1.95	1.95	1	0
0829	Coprostanol	ug/L	2	-	2	2	1	0
0831	Coprostanol	ug/L	1.9	-	1.9	1.9	1	0
0832	Coprostanol	ug/L	2	-	2	2	1	0
0834	Coprostanol	ug/L	2.05	-	2.05	2.05	1	0
0840	Coprostanol	ug/L	1.95	-	1.95	1.95	1	0
0852	Coprostanol	ug/L	1.9	-	1.9	1.9	1	0
0890	Coprostanol	ug/L	2	-	2	2	1	0
4903	Coprostanol	ug/L	1.95	-	1.95	1.95	1	0
0807	Dalapon	ug/L	0.038	0.036	0.005	0.075	15	0
0817	Dalapon	ug/L	0.038	0.036	0.005	0.075	15	0
0826	Dalapon	ug/L	0.033	0.035	0.005	0.075	15	0
0831	Dalapon	ug/L	0.036	0.036	0.005	0.075	16	0
0834	Dalapon	ug/L	0.036	0.036	0.005	0.075	16	0
0840	Dalapon	ug/L	0.033	0.035	0.005	0.075	15	0
0852	Dalapon	ug/L	0.035	0.036	0.005	0.075	14	0
0890	Dalapon	ug/L	0.037	0.036	0.0008	0.075	15	0
4903	Dalapon	ug/L	0.075	0	0.075	0.075	2	0
0560	Delta-BHC	ug/L	0.02	-	0.02	0.02	1	0
0804	Delta-BHC	ug/L	0.02	-	0.02	0.02	1	0
0807	Delta-BHC	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Delta-BHC	ug/L	0.025	-	0.025	0.025	1	0
0817	Delta-BHC	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Delta-BHC	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Delta-BHC	ug/L	0.025	-	0.025	0.025	1	0
0831	Delta-BHC	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Delta-BHC	ug/L	0.025	-	0.025	0.025	1	0
0834	Delta-BHC	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Delta-BHC	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Delta-BHC	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Delta-BHC	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Delta-BHC	ug/L	0.0084	0.010	0.0024	0.02	3	0
0807	Diazinon	ug/L	0.020	0	0.02	0.02	15	0
0817	Diazinon	ug/L	0.020	0	0.02	0.02	15	0
0826	Diazinon	ug/L	0.020	0	0.02	0.02	15	0
0831	Diazinon	ug/L	0.020	0	0.02	0.02	16	0
0834	Diazinon	ug/L	0.020	0	0.02	0.02	16	0
0840	Diazinon	ug/L	0.020	0	0.02	0.02	15	0
0852	Diazinon	ug/L	0.020	2.8E-10	0.02	0.02	14	0
0890	Diazinon	ug/L	0.020	0	0.02	0.02	15	0
4903	Diazinon	ug/L	0.02	0	0.02	0.02	2	0
0560	Dibenzo(a,h)anthracene	ug/L	0.8	-	0.8	0.8	1	0
0804	Dibenzo(a,h)anthracene	ug/L	0.75	-	0.75	0.75	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	Dibenzo(a,h)anthracene	ug/L	0.064	0.20	0.01	0.8	16	0
0814	Dibenzo(a,h)anthracene	ug/L	0.8	-	0.8	0.8	1	0
0817	Dibenzo(a,h)anthracene	ug/L	0.065	0.19	0.01	0.75	15	0
0826	Dibenzo(a,h)anthracene	ug/L	0.065	0.20	0.01	0.8	16	0
0829	Dibenzo(a,h)anthracene	ug/L	0.8	-	0.8	0.8	1	0
0831	Dibenzo(a,h)anthracene	ug/L	0.062	0.18	0.01	0.75	16	0
0832	Dibenzo(a,h)anthracene	ug/L	0.8	-	0.8	0.8	1	0
0834	Dibenzo(a,h)anthracene	ug/L	0.062	0.19	0.01	0.8	17	0
0840	Dibenzo(a,h)anthracene	ug/L	0.065	0.20	0.01	0.8	16	0
0852	Dibenzo(a,h)anthracene	ug/L	0.073	0.20	0.01	0.75	13	0
0890	Dibenzo(a,h)anthracene	ug/L	0.072	0.21	0.01	0.8	14	0
4903	Dibenzo(a,h)anthracene	ug/L	0.27	0.46	0.01	0.8	3	0
0560	Dibenzofuran	ug/L	0.485	-	0.485	0.485	1	0
0804	Dibenzofuran	ug/L	0.475	-	0.475	0.475	1	0
0807	Dibenzofuran	ug/L	0.035	0.12	0.0024	0.5	16	0
0814	Dibenzofuran	ug/L	0.5	-	0.5	0.5	1	0
0817	Dibenzofuran	ug/L	0.033	0.12	0.0024	0.475	16	0
0826	Dibenzofuran	ug/L	0.034	0.12	0.0024	0.485	16	0
0829	Dibenzofuran	ug/L	0.5	-	0.5	0.5	1	0
0831	Dibenzofuran	ug/L	0.031	0.11	0.0024	0.475	17	0
0832	Dibenzofuran	ug/L	0.5	-	0.5	0.5	1	0
0834	Dibenzofuran	ug/L	0.033	0.12	0.0024	0.5	17	0
0840	Dibenzofuran	ug/L	0.034	0.12	0.0024	0.485	16	0
0852	Dibenzofuran	ug/L	0.035	0.12	0.0024	0.475	15	0
0890	Dibenzofuran	ug/L	0.035	0.12	0.0024	0.5	16	0
4903	Dibenzofuran	ug/L	0.16	0.28	0.0024	0.485	3	0
0560	Dicamba	ug/L	0.08	-	0.08	0.08	1	0
0804	Dicamba	ug/L	0.075	-	0.075	0.075	1	0
0807	Dicamba	ug/L	0.041	0.032	0.01	0.08	16	0
0814	Dicamba	ug/L	0.075	-	0.075	0.075	1	0
0817	Dicamba	ug/L	0.040	0.031	0.01	0.075	16	0
0826	Dicamba	ug/L	0.037	0.031	0.01	0.075	16	0
0829	Dicamba	ug/L	0.075	-	0.075	0.075	1	0
0831	Dicamba	ug/L	0.039	0.031	0.01	0.075	17	0
0832	Dicamba	ug/L	0.08	-	0.08	0.08	1	0
0834	Dicamba	ug/L	0.039	0.031	0.01	0.075	17	0
0840	Dicamba	ug/L	0.037	0.031	0.01	0.075	16	0
0852	Dicamba	ug/L	0.038	0.031	0.01	0.075	15	0
0890	Dicamba	ug/L	0.040	0.032	0.0014	0.075	16	0
4903	Dicamba	ug/L	0.072	0.0029	0.07	0.075	3	0
0560	Dichloroprop	ug/L	0.13	-	0.13	0.13	1	0
0804	Dichloroprop	ug/L	0.12	-	0.12	0.12	1	0
0807	Dichloroprop	ug/L	0.037	0.036	0.005	0.125	16	0
0814	Dichloroprop	ug/L	0.125	-	0.125	0.125	1	0
0817	Dichloroprop	ug/L	0.037	0.036	0.005	0.125	16	0
0826	Dichloroprop	ug/L	0.033	0.036	0.005	0.125	16	0
0829	Dichloroprop	ug/L	0.12	-	0.12	0.12	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0831	Dichloroprop	ug/L	0.035	0.036	0.005	0.125	17	0
0832	Dichloroprop	ug/L	0.125	-	0.125	0.125	1	0
0834	Dichloroprop	ug/L	0.035	0.036	0.005	0.125	17	0
0840	Dichloroprop	ug/L	0.033	0.036	0.005	0.125	16	0
0852	Dichloroprop	ug/L	0.035	0.036	0.005	0.12	15	0
0890	Dichloroprop	ug/L	0.036	0.036	0.0007	0.12	16	0
4903	Dichloroprop	ug/L	0.082	0.038	0.06	0.125	3	0
0560	Dieldrin	ug/L	0.02	-	0.02	0.02	1	0
0804	Dieldrin	ug/L	0.02	-	0.02	0.02	1	0
0807	Dieldrin	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Dieldrin	ug/L	0.025	-	0.025	0.025	1	0
0817	Dieldrin	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Dieldrin	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Dieldrin	ug/L	0.025	-	0.025	0.025	1	0
0831	Dieldrin	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Dieldrin	ug/L	0.025	-	0.025	0.025	1	0
0834	Dieldrin	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Dieldrin	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Dieldrin	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Dieldrin	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Dieldrin	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Diethyl Phthalate	ug/L	0.485	-	0.485	0.485	1	0
0804	Diethyl Phthalate	ug/L	0.475	-	0.475	0.475	1	0
0807	Diethyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0814	Diethyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0817	Diethyl Phthalate	ug/L	0.475	-	0.475	0.475	1	0
0826	Diethyl Phthalate	ug/L	0.485	-	0.485	0.485	1	0
0829	Diethyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0831	Diethyl Phthalate	ug/L	0.475	-	0.475	0.475	1	0
0832	Diethyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0834	Diethyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0840	Diethyl Phthalate	ug/L	0.485	-	0.485	0.485	1	0
0852	Diethyl Phthalate	ug/L	0.475	-	0.475	0.475	1	0
0890	Diethyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
4903	Diethyl Phthalate	ug/L	0.485	-	0.485	0.485	1	0
0560	Dimethyl Phthalate	ug/L	0.195	-	0.195	0.195	1	0
0804	Dimethyl Phthalate	ug/L	0.19	-	0.19	0.19	1	0
0807	Dimethyl Phthalate	ug/L	0.018	0.052	0.0024	0.205	15	3
0814	Dimethyl Phthalate	ug/L	0.2	-	0.2	0.2	1	0
0817	Dimethyl Phthalate	ug/L	0.021	0.049	0.0024	0.19	14	9
0826	Dimethyl Phthalate	ug/L	0.018	0.049	0.0024	0.195	15	3
0829	Dimethyl Phthalate	ug/L	0.2	-	0.2	0.2	1	0
0831	Dimethyl Phthalate	ug/L	0.017	0.048	0.0024	0.19	15	2
0832	Dimethyl Phthalate	ug/L	0.2	-	0.2	0.2	1	0
0834	Dimethyl Phthalate	ug/L	0.018	0.052	0.0024	0.205	15	4
0840	Dimethyl Phthalate	ug/L	0.021	0.050	0.0024	0.195	15	5

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0852	Dimethyl Phthalate	ug/L	0.019	0.052	0.0024	0.19	13	2
0890	Dimethyl Phthalate	ug/L	0.017	0.049	0.0024	0.2	16	4
4903	Dimethyl Phthalate	ug/L	0.068	0.11	0.0025	0.195	3	1
0560	Di-N-Butyl Phthalate	ug/L	0.485	-	0.485	0.485	1	0
0804	Di-N-Butyl Phthalate	ug/L	0.475	-	0.475	0.475	1	0
0807	Di-N-Butyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0814	Di-N-Butyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0817	Di-N-Butyl Phthalate	ug/L	0.475	-	0.475	0.475	1	0
0826	Di-N-Butyl Phthalate	ug/L	0.485	-	0.485	0.485	1	0
0829	Di-N-Butyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0831	Di-N-Butyl Phthalate	ug/L	0.475	-	0.475	0.475	1	0
0832	Di-N-Butyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0834	Di-N-Butyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
0840	Di-N-Butyl Phthalate	ug/L	0.485	-	0.485	0.485	1	0
0852	Di-N-Butyl Phthalate	ug/L	0.475	-	0.475	0.475	1	0
0890	Di-N-Butyl Phthalate	ug/L	0.5	-	0.5	0.5	1	0
4903	Di-N-Butyl Phthalate	ug/L	0.485	-	0.485	0.485	1	0
0560	Di-N-Octyl Phthalate	ug/L	0.29	-	0.29	0.29	1	0
0804	Di-N-Octyl Phthalate	ug/L	0.285	-	0.285	0.285	1	0
0807	Di-N-Octyl Phthalate	ug/L	0.022	0.075	0.0024	0.305	16	0
0814	Di-N-Octyl Phthalate	ug/L	0.3	-	0.3	0.3	1	0
0817	Di-N-Octyl Phthalate	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	Di-N-Octyl Phthalate	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	Di-N-Octyl Phthalate	ug/L	0.3	-	0.3	0.3	1	0
0831	Di-N-Octyl Phthalate	ug/L	0.020	0.068	0.0024	0.285	17	0
0832	Di-N-Octyl Phthalate	ug/L	0.3	-	0.3	0.3	1	0
0834	Di-N-Octyl Phthalate	ug/L	0.021	0.073	0.0024	0.305	17	0
0840	Di-N-Octyl Phthalate	ug/L	0.028	0.074	0.0024	0.29	16	1
0852	Di-N-Octyl Phthalate	ug/L	0.024	0.075	0.0024	0.285	14	0
0890	Di-N-Octyl Phthalate	ug/L	0.022	0.074	0.0024	0.3	16	0
4903	Di-N-Octyl Phthalate	ug/L	0.098	0.17	0.0024	0.29	3	0
0560	Dinoseb	ug/L	0.18	-	0.18	0.18	1	0
0804	Dinoseb	ug/L	0.17	-	0.17	0.17	1	0
0807	Dinoseb	ug/L	0.029	0.040	0.01	0.175	16	0
0814	Dinoseb	ug/L	0.17	-	0.17	0.17	1	0
0817	Dinoseb	ug/L	0.029	0.039	0.01	0.17	16	0
0826	Dinoseb	ug/L	0.028	0.039	0.01	0.17	16	0
0829	Dinoseb	ug/L	0.17	-	0.17	0.17	1	0
0831	Dinoseb	ug/L	0.028	0.038	0.01	0.17	17	0
0832	Dinoseb	ug/L	0.175	-	0.175	0.175	1	0
0834	Dinoseb	ug/L	0.028	0.038	0.01	0.17	17	0
0840	Dinoseb	ug/L	0.028	0.040	0.01	0.175	16	0
0852	Dinoseb	ug/L	0.029	0.040	0.01	0.17	15	0
0890	Dinoseb	ug/L	0.028	0.039	0.0018	0.17	16	0
4903	Dinoseb	ug/L	0.077	0.081	0.03	0.17	3	0
0807	Disulfoton	ug/L	0.010	0	0.01	0.01	15	0
0817	Disulfoton	ug/L	0.010	0	0.01	0.01	15	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0826	Disulfoton	ug/L	0.010	0	0.01	0.01	15	0
0831	Disulfoton	ug/L	0.010	0	0.01	0.01	16	0
0834	Disulfoton	ug/L	0.010	0	0.01	0.01	16	0
0840	Disulfoton	ug/L	0.010	0	0.01	0.01	15	0
0852	Disulfoton	ug/L	0.010	1.4E-10	0.01	0.01	14	0
0890	Disulfoton	ug/L	0.010	0	0.01	0.01	15	0
4903	Disulfoton	ug/L	0.01	0	0.01	0.01	2	0
0560	Endosulfan I	ug/L	0.02	-	0.02	0.02	1	0
0804	Endosulfan I	ug/L	0.02	-	0.02	0.02	1	0
0807	Endosulfan I	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Endosulfan I	ug/L	0.025	-	0.025	0.025	1	0
0817	Endosulfan I	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Endosulfan I	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Endosulfan I	ug/L	0.025	-	0.025	0.025	1	0
0831	Endosulfan I	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Endosulfan I	ug/L	0.025	-	0.025	0.025	1	0
0834	Endosulfan I	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Endosulfan I	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Endosulfan I	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Endosulfan I	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Endosulfan I	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Endosulfan II	ug/L	0.02	-	0.02	0.02	1	0
0804	Endosulfan II	ug/L	0.02	-	0.02	0.02	1	0
0807	Endosulfan II	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Endosulfan II	ug/L	0.025	-	0.025	0.025	1	0
0817	Endosulfan II	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Endosulfan II	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Endosulfan II	ug/L	0.025	-	0.025	0.025	1	0
0831	Endosulfan II	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Endosulfan II	ug/L	0.025	-	0.025	0.025	1	0
0834	Endosulfan II	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Endosulfan II	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Endosulfan II	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Endosulfan II	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Endosulfan II	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Endosulfan Sulfate	ug/L	0.02	-	0.02	0.02	1	0
0804	Endosulfan Sulfate	ug/L	0.02	-	0.02	0.02	1	0
0807	Endosulfan Sulfate	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Endosulfan Sulfate	ug/L	0.025	-	0.025	0.025	1	0
0817	Endosulfan Sulfate	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Endosulfan Sulfate	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Endosulfan Sulfate	ug/L	0.025	-	0.025	0.025	1	0
0831	Endosulfan Sulfate	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Endosulfan Sulfate	ug/L	0.025	-	0.025	0.025	1	0
0834	Endosulfan Sulfate	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Endosulfan Sulfate	ug/L	0.0035	0.0044	0.0024	0.02	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0852	Endosulfan Sulfate	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Endosulfan Sulfate	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Endosulfan Sulfate	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Endrin	ug/L	0.02	-	0.02	0.02	1	0
0804	Endrin	ug/L	0.02	-	0.02	0.02	1	0
0807	Endrin	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Endrin	ug/L	0.025	-	0.025	0.025	1	0
0817	Endrin	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Endrin	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Endrin	ug/L	0.025	-	0.025	0.025	1	0
0831	Endrin	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Endrin	ug/L	0.025	-	0.025	0.025	1	0
0834	Endrin	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Endrin	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Endrin	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Endrin	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Endrin	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Endrin Aldehyde	ug/L	0.02	-	0.02	0.02	1	0
0804	Endrin Aldehyde	ug/L	0.02	-	0.02	0.02	1	0
0807	Endrin Aldehyde	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Endrin Aldehyde	ug/L	0.025	-	0.025	0.025	1	0
0817	Endrin Aldehyde	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Endrin Aldehyde	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Endrin Aldehyde	ug/L	0.025	-	0.025	0.025	1	0
0831	Endrin Aldehyde	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Endrin Aldehyde	ug/L	0.025	-	0.025	0.025	1	0
0834	Endrin Aldehyde	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Endrin Aldehyde	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Endrin Aldehyde	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Endrin Aldehyde	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Endrin Aldehyde	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0804	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0807	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0814	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0817	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0826	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0829	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0831	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0832	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0834	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0840	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0852	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0890	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
4903	Ethylbenzene	ug/L	0.5	-	0.5	0.5	1	0
0560	Fluoranthene	ug/L	0.29	-	0.29	0.29	1	0
0804	Fluoranthene	ug/L	0.285	-	0.285	0.285	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	Fluoranthene	ug/L	0.022	0.075	0.0024	0.305	16	0
0814	Fluoranthene	ug/L	0.3	-	0.3	0.3	1	0
0817	Fluoranthene	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	Fluoranthene	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	Fluoranthene	ug/L	0.3	-	0.3	0.3	1	0
0831	Fluoranthene	ug/L	0.020	0.068	0.0024	0.285	17	0
0832	Fluoranthene	ug/L	0.3	-	0.3	0.3	1	0
0834	Fluoranthene	ug/L	0.022	0.073	0.0024	0.305	17	2
0840	Fluoranthene	ug/L	0.022	0.072	0.0024	0.29	16	0
0852	Fluoranthene	ug/L	0.026	0.072	0.0024	0.285	15	2
0890	Fluoranthene	ug/L	0.022	0.074	0.0024	0.3	16	0
4903	Fluoranthene	ug/L	0.098	0.17	0.0024	0.29	3	0
0560	Fluorene	ug/L	0.29	-	0.29	0.29	1	0
0804	Fluorene	ug/L	0.285	-	0.285	0.285	1	0
0807	Fluorene	ug/L	0.022	0.075	0.0024	0.305	16	0
0814	Fluorene	ug/L	0.3	-	0.3	0.3	1	0
0817	Fluorene	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	Fluorene	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	Fluorene	ug/L	0.3	-	0.3	0.3	1	0
0831	Fluorene	ug/L	0.020	0.068	0.0024	0.285	17	0
0832	Fluorene	ug/L	0.3	-	0.3	0.3	1	0
0834	Fluorene	ug/L	0.021	0.073	0.0024	0.305	17	0
0840	Fluorene	ug/L	0.022	0.072	0.0024	0.29	16	0
0852	Fluorene	ug/L	0.022	0.073	0.0024	0.285	15	0
0890	Fluorene	ug/L	0.022	0.074	0.0024	0.3	16	0
4903	Fluorene	ug/L	0.098	0.17	0.0024	0.29	3	0
0560	Gamma-BHC (Lindane)	ug/L	0.02	-	0.02	0.02	1	0
0804	Gamma-BHC (Lindane)	ug/L	0.02	-	0.02	0.02	1	0
0807	Gamma-BHC (Lindane)	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Gamma-BHC (Lindane)	ug/L	0.025	-	0.025	0.025	1	0
0817	Gamma-BHC (Lindane)	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Gamma-BHC (Lindane)	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Gamma-BHC (Lindane)	ug/L	0.025	-	0.025	0.025	1	0
0831	Gamma-BHC (Lindane)	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Gamma-BHC (Lindane)	ug/L	0.025	-	0.025	0.025	1	0
0834	Gamma-BHC (Lindane)	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Gamma-BHC (Lindane)	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Gamma-BHC (Lindane)	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Gamma-BHC (Lindane)	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Gamma-BHC (Lindane)	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Hardness	mg CaCO3/L	40.6	-	40.6	40.6	1	1
0804	Hardness	mg CaCO3/L	39.9	2.7	36.4	48.3	19	19
0807	Hardness	mg CaCO3/L	38.2	2.3	33.7	43.6	17	17
0814	Hardness	mg	37.9	2.0	33.7	40.4	18	18

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
		CaCO3/L						
0817	Hardness	mg CaCO3/L	38.8	1.6	35.2	41	19	19
0826	Hardness	mg CaCO3/L	37.2	1.8	34.1	40.9	40	40
0829	Hardness	mg CaCO3/L	36.3	1.7	32.7	38.3	19	19
0831	Hardness	mg CaCO3/L	35.6	2.0	30.5	38.1	38	38
0832	Hardness	mg CaCO3/L	38.4	2.7	34.4	43.8	9	9
0834	Hardness	mg CaCO3/L	37.4	1.9	34.8	42.1	17	17
0840	Hardness	mg CaCO3/L	36.8	1.5	34.2	38.5	18	18
0852	Hardness	mg CaCO3/L	37.1	1.7	33.9	40.5	41	41
0890	Hardness	mg CaCO3/L	36.8	1.8	33	39.7	40	40
4903	Hardness	mg CaCO3/L	38.2	2.1	34.7	41	9	9
0560	Heptachlor	ug/L	0.02	-	0.02	0.02	1	0
0804	Heptachlor	ug/L	0.02	-	0.02	0.02	1	0
0807	Heptachlor	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Heptachlor	ug/L	0.025	-	0.025	0.025	1	0
0817	Heptachlor	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Heptachlor	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Heptachlor	ug/L	0.025	-	0.025	0.025	1	0
0831	Heptachlor	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Heptachlor	ug/L	0.025	-	0.025	0.025	1	0
0834	Heptachlor	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Heptachlor	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Heptachlor	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Heptachlor	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Heptachlor	ug/L	0.0084	0.010	0.0024	0.02	3	0
0560	Heptachlor Epoxide	ug/L	0.02	-	0.02	0.02	1	0
0804	Heptachlor Epoxide	ug/L	0.02	-	0.02	0.02	1	0
0807	Heptachlor Epoxide	ug/L	0.0039	0.0056	0.0024	0.025	16	0
0814	Heptachlor Epoxide	ug/L	0.025	-	0.025	0.025	1	0
0817	Heptachlor Epoxide	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0826	Heptachlor Epoxide	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0829	Heptachlor Epoxide	ug/L	0.025	-	0.025	0.025	1	0
0831	Heptachlor Epoxide	ug/L	0.0035	0.0043	0.0024	0.02	17	0
0832	Heptachlor Epoxide	ug/L	0.025	-	0.025	0.025	1	0
0834	Heptachlor Epoxide	ug/L	0.0038	0.0055	0.0024	0.025	17	0
0840	Heptachlor Epoxide	ug/L	0.0035	0.0044	0.0024	0.02	16	0
0852	Heptachlor Epoxide	ug/L	0.0036	0.0045	0.0024	0.02	15	0
0890	Heptachlor Epoxide	ug/L	0.0038	0.0056	0.0024	0.025	16	0
4903	Heptachlor Epoxide	ug/L	0.0084	0.010	0.0024	0.02	3	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0560	Hexachlorobenzene	ug/L	0.29	-	0.29	0.29	1	0
0804	Hexachlorobenzene	ug/L	0.285	-	0.285	0.285	1	0
0807	Hexachlorobenzene	ug/L	0.029	0.079	0.005	0.305	14	0
0814	Hexachlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0817	Hexachlorobenzene	ug/L	0.030	0.077	0.005	0.285	13	0
0826	Hexachlorobenzene	ug/L	0.029	0.075	0.005	0.29	14	0
0829	Hexachlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0831	Hexachlorobenzene	ug/L	0.027	0.072	0.005	0.285	15	0
0832	Hexachlorobenzene	ug/L	0.3	-	0.3	0.3	1	0
0834	Hexachlorobenzene	ug/L	0.028	0.077	0.005	0.305	15	0
0840	Hexachlorobenzene	ug/L	0.029	0.075	0.005	0.29	14	0
0852	Hexachlorobenzene	ug/L	0.030	0.077	0.005	0.285	13	0
0890	Hexachlorobenzene	ug/L	0.031	0.081	0.005	0.3	13	0
4903	Hexachlorobenzene	ug/L	0.15	0.20	0.005	0.29	2	0
0560	Hexachlorobutadiene	ug/L	0.485	-	0.485	0.485	1	0
0804	Hexachlorobutadiene	ug/L	0.475	-	0.475	0.475	1	0
0807	Hexachlorobutadiene	ug/L	0.046	0.12	0.01	0.5	16	0
0814	Hexachlorobutadiene	ug/L	0.5	-	0.5	0.5	1	0
0817	Hexachlorobutadiene	ug/L	0.044	0.12	0.01	0.475	16	0
0826	Hexachlorobutadiene	ug/L	0.045	0.12	0.01	0.485	16	0
0829	Hexachlorobutadiene	ug/L	0.5	-	0.5	0.5	1	0
0831	Hexachlorobutadiene	ug/L	0.043	0.11	0.01	0.475	17	0
0832	Hexachlorobutadiene	ug/L	0.5	-	0.5	0.5	1	0
0834	Hexachlorobutadiene	ug/L	0.044	0.12	0.01	0.5	17	0
0840	Hexachlorobutadiene	ug/L	0.046	0.12	0.01	0.485	16	0
0852	Hexachlorobutadiene	ug/L	0.046	0.12	0.01	0.475	15	0
0890	Hexachlorobutadiene	ug/L	0.046	0.12	0.01	0.5	16	0
4903	Hexachlorobutadiene	ug/L	0.17	0.27	0.01	0.485	3	0
0560	Hexachlorocyclopentadiene	ug/L	0.485	-	0.485	0.485	1	0
0804	Hexachlorocyclopentadiene	ug/L	0.475	-	0.475	0.475	1	0
0807	Hexachlorocyclopentadiene	ug/L	0.5	-	0.5	0.5	1	0
0814	Hexachlorocyclopentadiene	ug/L	0.5	-	0.5	0.5	1	0
0817	Hexachlorocyclopentadiene	ug/L	0.475	-	0.475	0.475	1	0
0826	Hexachlorocyclopentadiene	ug/L	0.485	-	0.485	0.485	1	0
0829	Hexachlorocyclopentadiene	ug/L	0.5	-	0.5	0.5	1	0
0831	Hexachlorocyclopentadiene	ug/L	0.475	-	0.475	0.475	1	0
0832	Hexachlorocyclopentadiene	ug/L	0.5	-	0.5	0.5	1	0
0834	Hexachlorocyclopentadiene	ug/L	0.5	-	0.5	0.5	1	0
0840	Hexachlorocyclopentadiene	ug/L	0.485	-	0.485	0.485	1	0
0852	Hexachlorocyclopentadiene	ug/L	0.475	-	0.475	0.475	1	0
0890	Hexachlorocyclopentadiene	ug/L	0.5	-	0.5	0.5	1	0
4903	Hexachlorocyclopentadiene	ug/L	0.485	-	0.485	0.485	1	0
0560	Hexachloroethane	ug/L	0.485	-	0.485	0.485	1	0
0804	Hexachloroethane	ug/L	0.475	-	0.475	0.475	1	0
0807	Hexachloroethane	ug/L	0.038	0.12	0.005	0.5	16	0
0814	Hexachloroethane	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0817	Hexachloroethane	ug/L	0.039	0.12	0.005	0.475	15	0
0826	Hexachloroethane	ug/L	0.038	0.12	0.005	0.485	16	0
0829	Hexachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0831	Hexachloroethane	ug/L	0.037	0.12	0.005	0.475	16	0
0832	Hexachloroethane	ug/L	0.5	-	0.5	0.5	1	0
0834	Hexachloroethane	ug/L	0.037	0.12	0.005	0.5	17	0
0840	Hexachloroethane	ug/L	0.038	0.12	0.005	0.485	16	0
0852	Hexachloroethane	ug/L	0.044	0.13	0.005	0.475	13	0
0890	Hexachloroethane	ug/L	0.043	0.13	0.005	0.5	14	0
4903	Hexachloroethane	ug/L	0.17	0.28	0.005	0.485	3	0
0560	Indeno(1,2,3-Cd)Pyrene	ug/L	0.485	-	0.485	0.485	1	0
0804	Indeno(1,2,3-Cd)Pyrene	ug/L	0.475	-	0.475	0.475	1	0
0807	Indeno(1,2,3-Cd)Pyrene	ug/L	0.046	0.12	0.01	0.5	16	0
0814	Indeno(1,2,3-Cd)Pyrene	ug/L	0.5	-	0.5	0.5	1	0
0817	Indeno(1,2,3-Cd)Pyrene	ug/L	0.044	0.12	0.01	0.475	16	0
0826	Indeno(1,2,3-Cd)Pyrene	ug/L	0.045	0.12	0.01	0.485	16	0
0829	Indeno(1,2,3-Cd)Pyrene	ug/L	0.5	-	0.5	0.5	1	0
0831	Indeno(1,2,3-Cd)Pyrene	ug/L	0.043	0.11	0.01	0.475	17	0
0832	Indeno(1,2,3-Cd)Pyrene	ug/L	0.5	-	0.5	0.5	1	0
0834	Indeno(1,2,3-Cd)Pyrene	ug/L	0.044	0.12	0.01	0.5	17	0
0840	Indeno(1,2,3-Cd)Pyrene	ug/L	0.046	0.12	0.01	0.485	16	0
0852	Indeno(1,2,3-Cd)Pyrene	ug/L	0.048	0.12	0.01	0.475	15	1
0890	Indeno(1,2,3-Cd)Pyrene	ug/L	0.046	0.12	0.01	0.5	16	0
4903	Indeno(1,2,3-Cd)Pyrene	ug/L	0.17	0.27	0.01	0.485	3	0
0804	Iron, Dissolved	mg/L	0.036	0.031	0.025	0.15	18	3
0807	Iron, Dissolved	mg/L	0.025	4.8E-10	0.025	0.025	16	0
0814	Iron, Dissolved	mg/L	0.025	5.5E-10	0.025	0.025	17	0
0817	Iron, Dissolved	mg/L	0.025	6.0E-10	0.025	0.025	18	0
0826	Iron, Dissolved	mg/L	0.025	8.2E-10	0.025	0.025	39	0
0829	Iron, Dissolved	mg/L	0.025	6.0E-10	0.025	0.025	18	0
0831	Iron, Dissolved	mg/L	0.025	8.2E-10	0.025	0.025	37	0
0832	Iron, Dissolved	mg/L	0.025	3.5E-10	0.025	0.025	8	0
0834	Iron, Dissolved	mg/L	0.025	4.8E-10	0.025	0.025	16	0
0840	Iron, Dissolved	mg/L	0.025	5.5E-10	0.025	0.025	17	0
0852	Iron, Dissolved	mg/L	0.025	7.5E-10	0.025	0.025	40	0
0890	Iron, Dissolved	mg/L	0.025	8.2E-10	0.025	0.025	39	0
4903	Iron, Dissolved	mg/L	0.025	3.5E-10	0.025	0.025	8	0
0560	Iron, Total	mg/L	0.025	-	0.025	0.025	1	0
0804	Iron, Total	mg/L	0.11	0.097	0.025	0.37	19	14
0807	Iron, Total	mg/L	0.039	0.024	0.025	0.09	17	5
0814	Iron, Total	mg/L	0.036	0.034	0.025	0.17	18	3
0817	Iron, Total	mg/L	0.063	0.090	0.025	0.42	19	9
0826	Iron, Total	mg/L	0.047	0.027	0.025	0.12	40	20
0829	Iron, Total	mg/L	0.049	0.069	0.025	0.33	19	6
0831	Iron, Total	mg/L	0.051	0.085	0.025	0.55	38	13
0832	Iron, Total	mg/L	0.12	0.23	0.025	0.72	9	4
0834	Iron, Total	mg/L	0.16	0.44	0.025	1.84	17	3

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0840	Iron, Total	mg/L	0.065	0.085	0.025	0.3	18	8
0852	Iron, Total	mg/L	0.050	0.028	0.025	0.13	41	23
0890	Iron, Total	mg/L	0.042	0.024	0.025	0.12	40	16
4903	Iron, Total	mg/L	0.18	0.30	0.025	0.96	9	6
0560	Isophorone	ug/L	0.485	-	0.485	0.485	1	0
0804	Isophorone	ug/L	0.475	-	0.475	0.475	1	0
0807	Isophorone	ug/L	0.035	0.12	0.0024	0.5	16	1
0814	Isophorone	ug/L	0.5	-	0.5	0.5	1	0
0817	Isophorone	ug/L	0.033	0.12	0.0024	0.475	16	0
0826	Isophorone	ug/L	0.034	0.12	0.0024	0.485	16	0
0829	Isophorone	ug/L	0.5	-	0.5	0.5	1	0
0831	Isophorone	ug/L	0.032	0.11	0.0024	0.475	17	1
0832	Isophorone	ug/L	0.5	-	0.5	0.5	1	0
0834	Isophorone	ug/L	0.033	0.12	0.0024	0.5	17	0
0840	Isophorone	ug/L	0.034	0.12	0.0024	0.485	16	0
0852	Isophorone	ug/L	0.036	0.12	0.0024	0.475	15	1
0890	Isophorone	ug/L	0.036	0.12	0.0024	0.5	16	2
4903	Isophorone	ug/L	0.17	0.28	0.0024	0.485	3	1
0804	Lead, Dissolved	mg/L	0.000021	0.000020	1E-05	8.1E-05	18	4
0807	Lead, Dissolved	mg/L	0.000014	0.0000051	1E-05	3.3E-05	16	1
0814	Lead, Dissolved	mg/L	0.0000125	3.5E-13	1E-05	1.3E-05	17	0
0817	Lead, Dissolved	mg/L	0.000013	0.0000037	1E-05	2.8E-05	18	1
0826	Lead, Dissolved	mg/L	0.000093	0.00022	1E-05	0.00139	38	1
0829	Lead, Dissolved	mg/L	0.0000125	3.3E-13	1E-05	1.3E-05	18	0
0831	Lead, Dissolved	mg/L	0.000074	0.000096	1E-05	0.00057	36	1
0832	Lead, Dissolved	mg/L	0.0000125	2.4E-13	1E-05	1.3E-05	8	0
0834	Lead, Dissolved	mg/L	0.000017	0.000014	1E-05	6.9E-05	16	1
0840	Lead, Dissolved	mg/L	0.0000125	3.5E-13	1E-05	1.3E-05	17	0
0852	Lead, Dissolved	mg/L	0.000068	0.000083	1E-05	0.0005	39	1
0890	Lead, Dissolved	mg/L	0.000072	0.00010	1E-05	0.00062	38	1
4903	Lead, Dissolved	mg/L	0.000057	0.00012	1E-05	0.00035	8	2
0560	Lead, Total	mg/L	0.00025	-	0.0003	0.00025	1	0
0804	Lead, Total	mg/L	0.00011	0.00013	1E-05	0.00059	19	16
0807	Lead, Total	mg/L	0.00013	0.00023	1E-05	0.001	17	15
0814	Lead, Total	mg/L	0.000094	0.00018	1E-05	0.00081	18	17
0817	Lead, Total	mg/L	0.00026	0.00079	3E-05	0.00353	19	19
0826	Lead, Total	mg/L	0.000095	0.000061	1E-05	0.00032	40	19
0829	Lead, Total	mg/L	0.000087	0.00016	1E-05	0.00076	19	16
0831	Lead, Total	mg/L	0.000082	0.000050	1E-05	0.00025	38	13
0832	Lead, Total	mg/L	0.00015	0.00029	1E-05	0.00092	9	8
0834	Lead, Total	mg/L	0.00088	0.0025	3E-05	0.01	17	17
0840	Lead, Total	mg/L	0.000053	0.000053	1E-05	0.00025	18	13
0852	Lead, Total	mg/L	0.000098	0.000060	1E-05	0.00038	41	17
0890	Lead, Total	mg/L	0.00046	0.0023	1E-05	0.015	41	18
4903	Lead, Total	mg/L	0.00049	0.00073	5E-05	0.00206	8	8
0804	Magnesium, Dissolved	mg/L	4.0	0.41	3.59	5.29	18	18

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	Magnesium, Dissolved	mg/L	3.7	0.23	3.36	4.21	16	16
0814	Magnesium, Dissolved	mg/L	3.7	0.21	3.32	4.02	17	17
0817	Magnesium, Dissolved	mg/L	3.8	0.17	3.5	4.12	18	18
0826	Magnesium, Dissolved	mg/L	3.6	0.19	3.31	4.01	39	39
0829	Magnesium, Dissolved	mg/L	3.4	0.29	2.97	3.97	18	18
0831	Magnesium, Dissolved	mg/L	3.3	0.25	2.57	3.88	37	37
0832	Magnesium, Dissolved	mg/L	3.7	0.27	3.19	3.96	8	8
0834	Magnesium, Dissolved	mg/L	3.6	0.21	3.24	3.91	16	16
0840	Magnesium, Dissolved	mg/L	3.5	0.20	3.17	3.84	17	17
0852	Magnesium, Dissolved	mg/L	3.5	0.17	3.2	3.87	40	40
0890	Magnesium, Dissolved	mg/L	3.5	0.18	3.08	3.92	39	39
4903	Magnesium, Dissolved	mg/L	3.6	0.25	3.27	4.06	8	8
0560	Magnesium, Total	mg/L	3.92	-	3.92	3.92	1	1
0804	Magnesium, Total	mg/L	3.9	0.36	3.46	5.1	19	19
0807	Magnesium, Total	mg/L	3.7	0.27	3.16	4.25	17	17
0814	Magnesium, Total	mg/L	3.6	0.24	3.16	3.88	18	18
0817	Magnesium, Total	mg/L	3.8	0.20	3.33	4	19	19
0826	Magnesium, Total	mg/L	3.5	0.21	3.21	3.91	40	40
0829	Magnesium, Total	mg/L	3.4	0.24	2.97	3.77	19	19
0831	Magnesium, Total	mg/L	3.3	0.25	2.62	3.68	38	38
0832	Magnesium, Total	mg/L	3.7	0.32	3.22	4.28	9	9
0834	Magnesium, Total	mg/L	3.6	0.23	3.2	4.1	17	17
0840	Magnesium, Total	mg/L	3.4	0.19	3.14	3.7	18	18
0852	Magnesium, Total	mg/L	3.5	0.19	3.12	3.83	41	41
0890	Magnesium, Total	mg/L	3.5	0.19	3.06	3.79	40	40
4903	Magnesium, Total	mg/L	3.6	0.26	3.21	3.94	9	9
0807	Malathion	ug/L	0.020	0	0.02	0.02	15	0
0817	Malathion	ug/L	0.020	0	0.02	0.02	15	0
0826	Malathion	ug/L	0.020	0	0.02	0.02	15	0
0831	Malathion	ug/L	0.020	0	0.02	0.02	16	0
0834	Malathion	ug/L	0.020	0	0.02	0.02	16	0
0840	Malathion	ug/L	0.020	0	0.02	0.02	15	0
0852	Malathion	ug/L	0.020	2.8E-10	0.02	0.02	14	0
0890	Malathion	ug/L	0.020	0	0.02	0.02	15	0
4903	Malathion	ug/L	0.02	0	0.02	0.02	2	0
0826	Manganese, Total	mg/L	0.01	-	0.01	0.01	1	1
0560	MCPA	ug/L	0.185	-	0.185	0.185	1	0
0804	MCPA	ug/L	0.175	-	0.175	0.175	1	0
0807	MCPA	ug/L	0.058	0.058	0.005	0.18	16	0
0814	MCPA	ug/L	0.175	-	0.175	0.175	1	0
0817	MCPA	ug/L	0.057	0.057	0.005	0.175	16	0
0826	MCPA	ug/L	0.051	0.057	0.005	0.175	16	0
0829	MCPA	ug/L	0.175	-	0.175	0.175	1	0
0831	MCPA	ug/L	0.054	0.056	0.005	0.175	17	0
0832	MCPA	ug/L	0.18	-	0.18	0.18	1	0
0834	MCPA	ug/L	0.054	0.056	0.005	0.175	17	0
0840	MCPA	ug/L	0.052	0.058	0.005	0.18	16	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0852	MCPA	ug/L	0.054	0.058	0.005	0.175	15	0
0890	MCPA	ug/L	0.057	0.057	0.0007	0.175	16	0
4903	MCPA	ug/L	0.13	0.043	0.1	0.175	3	0
0560	MCPP	ug/L	0.165	-	0.165	0.165	1	0
0804	MCPP	ug/L	0.155	-	0.155	0.155	1	0
0807	MCPP	ug/L	0.037	0.041	0.005	0.16	16	0
0814	MCPP	ug/L	0.155	-	0.155	0.155	1	0
0817	MCPP	ug/L	0.036	0.040	0.005	0.155	16	0
0826	MCPP	ug/L	0.033	0.041	0.005	0.155	16	0
0829	MCPP	ug/L	0.155	-	0.155	0.155	1	0
0831	MCPP	ug/L	0.034	0.040	0.005	0.155	17	0
0832	MCPP	ug/L	0.16	-	0.16	0.16	1	0
0834	MCPP	ug/L	0.034	0.040	0.005	0.155	17	0
0840	MCPP	ug/L	0.033	0.042	0.005	0.16	16	0
0852	MCPP	ug/L	0.035	0.041	0.005	0.155	15	0
0890	MCPP	ug/L	0.036	0.041	0.0008	0.155	16	0
4903	MCPP	ug/L	0.088	0.058	0.055	0.155	3	0
0804	Mercury, Dissolved	mg/L	0.00000046	0.00000033	2E-07	1.3E-06	18	18
0807	Mercury, Dissolved	mg/L	0.00000042	0.00000036	1E-07	1.7E-06	16	16
0814	Mercury, Dissolved	mg/L	0.00000037	0.00000018	2E-07	8.4E-07	17	17
0817	Mercury, Dissolved	mg/L	0.00000057	0.00000057	2E-07	1.9E-06	18	18
0826	Mercury, Dissolved	mg/L	0.000054	0.000050	2E-07	0.0001	39	18
0829	Mercury, Dissolved	mg/L	0.00000039	0.00000032	1E-07	1.4E-06	18	18
0831	Mercury, Dissolved	mg/L	0.000057	0.000050	1E-07	0.0001	37	16
0832	Mercury, Dissolved	mg/L	0.00000033	0.00000022	5E-08	8.4E-07	8	7
0834	Mercury, Dissolved	mg/L	3.34E-07	0.00000023	1E-07	1E-06	16	16
0840	Mercury, Dissolved	mg/L	0.00000044	0.00000049	1E-07	1.8E-06	17	17
0852	Mercury, Dissolved	mg/L	0.000053	0.000050	2E-07	0.0001	40	19
0890	Mercury, Dissolved	mg/L	0.000054	0.000050	2E-07	0.0001	39	18
4903	Mercury, Dissolved	mg/L	0.00000036	0.00000018	1E-07	6.5E-07	9	9
0560	Mercury, Total	mg/L	0.0001	-	0.0001	0.0001	1	0
0804	Mercury, Total	mg/L	0.0000060	0.000023	3E-07	0.0001	19	18
0807	Mercury, Total	mg/L	0.0000065	0.000024	2E-07	0.0001	17	16
0814	Mercury, Total	mg/L	0.0000061	0.000023	3E-07	0.0001	18	17
0817	Mercury, Total	mg/L	0.0000060	0.000023	3E-07	0.0001	19	18
0826	Mercury, Total	mg/L	0.000055	0.000050	3E-07	0.0001	40	18
0829	Mercury, Total	mg/L	0.0000058	0.000023	2E-07	0.0001	19	18
0831	Mercury, Total	mg/L	0.000058	0.000050	2E-07	0.0001	38	16
0832	Mercury, Total	mg/L	0.000012	0.000033	2E-07	0.0001	9	8
0834	Mercury, Total	mg/L	0.0000071	0.000024	2E-07	0.0001	17	16
0840	Mercury, Total	mg/L	0.0000061	0.000023	2E-07	0.0001	18	17
0852	Mercury, Total	mg/L	0.000054	0.000050	2E-07	0.0001	41	19
0890	Mercury, Total	mg/L	0.000062	0.000070	2E-07	0.00037	40	19
4903	Mercury, Total	mg/L	0.000013	0.000031	3E-07	0.0001	10	9
0560	Methoxychlor	ug/L	0.12	-	0.12	0.12	1	0
0804	Methoxychlor	ug/L	0.12	-	0.12	0.12	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0807	Methoxychlor	ug/L	0.018	0.030	0.01	0.13	16	0
0814	Methoxychlor	ug/L	0.125	-	0.125	0.125	1	0
0817	Methoxychlor	ug/L	0.017	0.028	0.01	0.12	16	0
0826	Methoxychlor	ug/L	0.017	0.028	0.01	0.12	16	0
0829	Methoxychlor	ug/L	0.125	-	0.125	0.125	1	0
0831	Methoxychlor	ug/L	0.016	0.027	0.01	0.12	17	0
0832	Methoxychlor	ug/L	0.125	-	0.125	0.125	1	0
0834	Methoxychlor	ug/L	0.017	0.029	0.01	0.13	17	0
0840	Methoxychlor	ug/L	0.017	0.028	0.01	0.12	16	0
0852	Methoxychlor	ug/L	0.017	0.028	0.01	0.12	15	0
0890	Methoxychlor	ug/L	0.017	0.029	0.01	0.125	16	0
4903	Methoxychlor	ug/L	0.047	0.064	0.01	0.12	3	0
0560	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0804	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0807	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0814	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0817	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0826	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0829	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0831	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0832	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0834	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0840	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0852	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0890	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
4903	Methylene Chloride	ug/L	2.5	-	2.5	2.5	1	0
0804	Molybdenum, Dissolved	mg/L	0.00026	0.000012	0.0002	0.00029	18	18
0807	Molybdenum, Dissolved	mg/L	0.00026	0.0000098	0.0002	0.00029	16	16
0814	Molybdenum, Dissolved	mg/L	0.00026	0.0000087	0.0002	0.00028	17	17
0817	Molybdenum, Dissolved	mg/L	0.00026	0.000013	0.0002	0.00029	18	18
0826	Molybdenum, Dissolved	mg/L	0.00025	0.0000082	0.0002	0.00027	37	18
0829	Molybdenum, Dissolved	mg/L	0.00026	0.000013	0.0002	0.00029	18	18
0831	Molybdenum, Dissolved	mg/L	0.00025	0.0000088	0.0002	0.00028	35	16
0832	Molybdenum, Dissolved	mg/L	0.00027	0.000014	0.0002	0.00029	8	8
0834	Molybdenum, Dissolved	mg/L	0.00028	0.000065	0.0002	0.00052	16	16
0840	Molybdenum, Dissolved	mg/L	0.00025	0.000014	0.0002	0.00028	17	17
0852	Molybdenum, Dissolved	mg/L	0.00025	0.0000098	0.0002	0.00028	38	19
0890	Molybdenum, Dissolved	mg/L	0.00025	0.0000096	0.0002	0.00027	37	18
4903	Molybdenum, Dissolved	mg/L	0.00027	0.000017	0.0003	0.00031	8	8
0560	Molybdenum, Total	mg/L	0.00025	-	0.0003	0.00025	1	0
0804	Molybdenum, Total	mg/L	0.00026	0.000012	0.0002	0.00028	19	18
0807	Molybdenum, Total	mg/L	0.00026	0.0000072	0.0003	0.00027	17	16
0814	Molybdenum, Total	mg/L	0.00026	0.0000094	0.0002	0.00028	18	17
0817	Molybdenum, Total	mg/L	0.00026	0.000011	0.0002	0.00028	19	18
0826	Molybdenum, Total	mg/L	0.00025	0.0000076	0.0002	0.00028	40	18
0829	Molybdenum, Total	mg/L	0.00026	0.000011	0.0002	0.00028	19	18
0831	Molybdenum, Total	mg/L	0.00025	0.0000086	0.0002	0.00028	38	16

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0832	Molybdenum, Total	mg/L	0.00027	0.000016	0.0003	0.0003	9	8
0834	Molybdenum, Total	mg/L	0.00026	0.000016	0.0002	0.00029	17	16
0840	Molybdenum, Total	mg/L	0.00025	0.000012	0.0002	0.00028	18	17
0852	Molybdenum, Total	mg/L	0.00025	0.000010	0.0002	0.00027	41	19
0890	Molybdenum, Total	mg/L	0.00025	0.0000096	0.0002	0.00028	40	18
4903	Molybdenum, Total	mg/L	0.00028	0.000033	0.0003	0.00036	9	8
0560	Naphthalene	ug/L	0.8	-	0.8	0.8	1	0
0804	Naphthalene	ug/L	0.75	-	0.75	0.75	1	0
0807	Naphthalene	ug/L	0.057	0.20	0.005	0.8	16	0
0814	Naphthalene	ug/L	0.8	-	0.8	0.8	1	0
0817	Naphthalene	ug/L	0.054	0.19	0.005	0.75	16	0
0826	Naphthalene	ug/L	0.058	0.20	0.005	0.8	16	0
0829	Naphthalene	ug/L	0.8	-	0.8	0.8	1	0
0831	Naphthalene	ug/L	0.053	0.18	0.005	0.75	17	2
0832	Naphthalene	ug/L	0.8	-	0.8	0.8	1	0
0834	Naphthalene	ug/L	0.062	0.19	0.005	0.8	17	2
0840	Naphthalene	ug/L	0.063	0.20	0.005	0.8	16	2
0852	Naphthalene	ug/L	0.057	0.19	0.005	0.75	15	0
0890	Naphthalene	ug/L	0.058	0.20	0.005	0.8	16	1
4903	Naphthalene	ug/L	0.27	0.46	0.005	0.8	3	0
0804	Nickel, Dissolved	mg/L	0.00055	0.00010	0.0005	0.00083	18	18
0807	Nickel, Dissolved	mg/L	0.00049	0.000038	0.0004	0.00058	16	16
0814	Nickel, Dissolved	mg/L	0.00048	0.000019	0.0004	0.00051	17	17
0817	Nickel, Dissolved	mg/L	0.00050	0.000029	0.0004	0.00055	18	18
0826	Nickel, Dissolved	mg/L	0.00053	0.000078	0.0003	0.00072	38	38
0829	Nickel, Dissolved	mg/L	0.00044	0.000021	0.0004	0.00047	18	18
0831	Nickel, Dissolved	mg/L	0.00047	0.000080	0.0002	0.00065	36	35
0832	Nickel, Dissolved	mg/L	0.00047	0.000019	0.0004	0.0005	8	8
0834	Nickel, Dissolved	mg/L	0.00049	0.00010	0.0004	0.00087	16	16
0840	Nickel, Dissolved	mg/L	0.00045	0.000020	0.0004	0.00049	17	17
0852	Nickel, Dissolved	mg/L	0.00052	0.000072	0.0003	0.0007	39	39
0890	Nickel, Dissolved	mg/L	0.00050	0.000067	0.0003	0.00065	38	38
4903	Nickel, Dissolved	mg/L	0.00049	0.000037	0.0004	0.00057	8	8
0560	Nickel, Total	mg/L	0.00086	-	0.0009	0.00086	1	1
0804	Nickel, Total	mg/L	0.00064	0.00016	0.0005	0.00104	19	19
0807	Nickel, Total	mg/L	0.00057	0.00012	0.0005	0.00095	17	17
0814	Nickel, Total	mg/L	0.00054	0.00014	0.0005	0.0011	18	18
0817	Nickel, Total	mg/L	0.00070	0.00046	0.0005	0.00238	19	19
0826	Nickel, Total	mg/L	0.00058	0.00011	0.0004	0.00098	40	40
0829	Nickel, Total	mg/L	0.00052	0.00019	0.0004	0.0013	19	19
0831	Nickel, Total	mg/L	0.00052	0.00011	0.0003	0.00089	38	38
0832	Nickel, Total	mg/L	0.00061	0.00033	0.0004	0.0015	9	9
0834	Nickel, Total	mg/L	0.00067	0.00060	0.0004	0.00288	17	17
0840	Nickel, Total	mg/L	0.00051	0.00012	0.0004	0.00097	18	18
0852	Nickel, Total	mg/L	0.00056	0.00010	0.0004	0.00099	41	41
0890	Nickel, Total	mg/L	0.00079	0.0015	0.0004	0.01	41	40

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
4903	Nickel, Total	mg/L	0.00083	0.00071	0.0004	0.00265	9	9
0560	Nitrobenzene	ug/L	0.485	-	0.485	0.485	1	0
0804	Nitrobenzene	ug/L	0.475	-	0.475	0.475	1	0
0807	Nitrobenzene	ug/L	0.035	0.12	0.0024	0.5	16	0
0814	Nitrobenzene	ug/L	0.5	-	0.5	0.5	1	0
0817	Nitrobenzene	ug/L	0.033	0.12	0.0024	0.475	16	0
0826	Nitrobenzene	ug/L	0.034	0.12	0.0024	0.485	16	0
0829	Nitrobenzene	ug/L	0.5	-	0.5	0.5	1	0
0831	Nitrobenzene	ug/L	0.031	0.11	0.0024	0.475	17	0
0832	Nitrobenzene	ug/L	0.5	-	0.5	0.5	1	0
0834	Nitrobenzene	ug/L	0.033	0.12	0.0024	0.5	17	0
0840	Nitrobenzene	ug/L	0.034	0.12	0.0024	0.485	16	0
0852	Nitrobenzene	ug/L	0.035	0.12	0.0024	0.475	15	0
0890	Nitrobenzene	ug/L	0.035	0.12	0.0024	0.5	16	0
4903	Nitrobenzene	ug/L	0.16	0.28	0.0024	0.485	3	0
0560	N-Nitrosodimethylamine	ug/L	1.95	-	1.95	1.95	1	0
0804	N-Nitrosodimethylamine	ug/L	1.9	-	1.9	1.9	1	0
0807	N-Nitrosodimethylamine	ug/L	0.14	0.53	0.005	2.05	15	0
0814	N-Nitrosodimethylamine	ug/L	2	-	2	2	1	0
0817	N-Nitrosodimethylamine	ug/L	0.13	0.47	0.005	1.9	16	0
0826	N-Nitrosodimethylamine	ug/L	0.13	0.49	0.005	1.95	16	0
0829	N-Nitrosodimethylamine	ug/L	2	-	2	2	1	0
0831	N-Nitrosodimethylamine	ug/L	0.13	0.47	0.005	1.9	16	0
0832	N-Nitrosodimethylamine	ug/L	2	-	2	2	1	0
0834	N-Nitrosodimethylamine	ug/L	0.13	0.50	0.005	2.05	17	0
0840	N-Nitrosodimethylamine	ug/L	0.13	0.49	0.005	1.95	16	0
0852	N-Nitrosodimethylamine	ug/L	0.14	0.51	0.005	1.9	14	0
0890	N-Nitrosodimethylamine	ug/L	0.13	0.50	0.005	2	16	0
4903	N-Nitrosodimethylamine	ug/L	0.65	1.1	0.005	1.95	3	0
0560	N-Nitrosodi-N-Propylamine	ug/L	0.485	-	0.485	0.485	1	0
0804	N-Nitrosodi-N-Propylamine	ug/L	0.475	-	0.475	0.475	1	0
0807	N-Nitrosodi-N-Propylamine	ug/L	0.063	0.12	0.02	0.5	16	0
0814	N-Nitrosodi-N-Propylamine	ug/L	0.5	-	0.5	0.5	1	0
0817	N-Nitrosodi-N-Propylamine	ug/L	0.061	0.11	0.02	0.475	16	0
0826	N-Nitrosodi-N-Propylamine	ug/L	0.063	0.11	0.02	0.485	16	0
0829	N-Nitrosodi-N-Propylamine	ug/L	0.5	-	0.5	0.5	1	0
0831	N-Nitrosodi-N-Propylamine	ug/L	0.060	0.11	0.02	0.475	17	0
0832	N-Nitrosodi-N-Propylamine	ug/L	0.5	-	0.5	0.5	1	0
0834	N-Nitrosodi-N-Propylamine	ug/L	0.061	0.11	0.02	0.5	17	0
0840	N-Nitrosodi-N-Propylamine	ug/L	0.063	0.11	0.02	0.485	16	0
0852	N-Nitrosodi-N-Propylamine	ug/L	0.064	0.11	0.02	0.475	15	0
0890	N-Nitrosodi-N-Propylamine	ug/L	0.063	0.12	0.02	0.5	16	0
4903	N-Nitrosodi-N-Propylamine	ug/L	0.18	0.27	0.02	0.485	3	0
0560	N-Nitrosodiphenylamine	ug/L	0.485	-	0.485	0.485	1	0
0804	N-Nitrosodiphenylamine	ug/L	0.475	-	0.475	0.475	1	0
0807	N-Nitrosodiphenylamine	ug/L	0.12	0.11	0.06	0.5	16	0
0814	N-Nitrosodiphenylamine	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0817	N-Nitrosodiphenylamine	ug/L	0.12	0.10	0.06	0.475	16	0
0826	N-Nitrosodiphenylamine	ug/L	0.12	0.10	0.06	0.485	16	0
0829	N-Nitrosodiphenylamine	ug/L	0.5	-	0.5	0.5	1	0
0831	N-Nitrosodiphenylamine	ug/L	0.12	0.097	0.06	0.475	17	0
0832	N-Nitrosodiphenylamine	ug/L	0.5	-	0.5	0.5	1	0
0834	N-Nitrosodiphenylamine	ug/L	0.12	0.10	0.06	0.5	17	0
0840	N-Nitrosodiphenylamine	ug/L	0.12	0.10	0.06	0.485	16	0
0852	N-Nitrosodiphenylamine	ug/L	0.12	0.10	0.06	0.475	15	0
0890	N-Nitrosodiphenylamine	ug/L	0.12	0.11	0.06	0.5	16	0
4903	N-Nitrosodiphenylamine	ug/L	0.20	0.25	0.06	0.485	3	0
0807	Parathion-Ethyl	ug/L	0.020	0	0.02	0.02	15	0
0817	Parathion-Ethyl	ug/L	0.020	0	0.02	0.02	15	0
0826	Parathion-Ethyl	ug/L	0.020	0	0.02	0.02	15	0
0831	Parathion-Ethyl	ug/L	0.020	0	0.02	0.02	16	0
0834	Parathion-Ethyl	ug/L	0.020	0	0.02	0.02	16	0
0840	Parathion-Ethyl	ug/L	0.020	0	0.02	0.02	15	0
0852	Parathion-Ethyl	ug/L	0.020	2.8E-10	0.02	0.02	14	0
0890	Parathion-Ethyl	ug/L	0.020	0	0.02	0.02	15	0
4903	Parathion-Ethyl	ug/L	0.02	0	0.02	0.02	2	0
0807	Parathion-Methyl	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0817	Parathion-Methyl	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0826	Parathion-Methyl	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0831	Parathion-Methyl	ug/L	0.015	4.5E-10	0.015	0.015	16	0
0834	Parathion-Methyl	ug/L	0.015	4.5E-10	0.015	0.015	16	0
0840	Parathion-Methyl	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0852	Parathion-Methyl	ug/L	0.015	4.4E-10	0.015	0.015	14	0
0890	Parathion-Methyl	ug/L	0.015	4.5E-10	0.015	0.015	15	0
4903	Parathion-Methyl	ug/L	0.015	0	0.015	0.015	2	0
0560	Pentachlorophenol	ug/L	0.485	-	0.485	0.485	1	0
0804	Pentachlorophenol	ug/L	0.475	-	0.475	0.475	1	0
0807	Pentachlorophenol	ug/L	0.073	0.12	0.025	0.5	16	0
0814	Pentachlorophenol	ug/L	0.5	-	0.5	0.5	1	0
0817	Pentachlorophenol	ug/L	0.071	0.11	0.025	0.475	16	0
0826	Pentachlorophenol	ug/L	0.075	0.11	0.025	0.485	16	0
0829	Pentachlorophenol	ug/L	0.5	-	0.5	0.5	1	0
0831	Pentachlorophenol	ug/L	0.071	0.11	0.025	0.475	17	0
0832	Pentachlorophenol	ug/L	0.5	-	0.5	0.5	1	0
0834	Pentachlorophenol	ug/L	0.073	0.11	0.025	0.5	17	0
0840	Pentachlorophenol	ug/L	0.076	0.11	0.03	0.485	16	0
0852	Pentachlorophenol	ug/L	0.075	0.11	0.025	0.475	15	0
0890	Pentachlorophenol	ug/L	0.073	0.11	0.025	0.5	16	0
4903	Pentachlorophenol	ug/L	0.18	0.26	0.025	0.485	3	0
0804	Phaeophytin	ug/L	0.65	0.48	0.15	1.9	66	51
0804	Phaeophytin	mg/m3	1.9	1.8	0.005	13.75	288	282
0807	Phaeophytin	ug/L	0.83	0.83	0.15	4.27	66	51
0807	Phaeophytin	mg/m3	1.9	2.8	0.005	26.9	338	330

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0814	Phaeophytin	ug/L	0.42	0.32	0.15	1.6	66	40
0814	Phaeophytin	mg/m3	1.6	2.1	0.005	25.12	287	276
0817	Phaeophytin	ug/L	0.55	0.49	0.15	2	66	36
0817	Phaeophytin	mg/m3	1.2	1.0	0.005	5.2	113	110
0826	Phaeophytin	ug/L	0.50	0.45	0.15	2	65	35
0826	Phaeophytin	mg/m3	0.98	0.99	0.005	5.23	134	130
0829	Phaeophytin	ug/L	0.40	0.29	0.15	1.4	65	34
0829	Phaeophytin	mg/m3	1.0	1.1	0.005	6.4	129	121
0831	Phaeophytin	ug/L	0.43	0.35	0.15	2.1	65	36
0831	Phaeophytin	mg/m3	1.1	1.3	0.005	10	148	132
0832	Phaeophytin	ug/L	0.50	0.37	0.15	1.55	65	40
0832	Phaeophytin	mg/m3	1.9	2.1	0.005	14.7	288	278
0834	Phaeophytin	ug/L	0.38	0.34	0.15	1.4	73	31
0834	Phaeophytin	mg/m3	1.4	1.6	0.005	12.89	287	277
0840	Phaeophytin	ug/L	0.52	0.45	0.15	2.6	65	40
0840	Phaeophytin	mg/m3	1.1	1.3	0.005	8	60	55
0852	Phaeophytin	ug/L	0.45	0.48	0.15	5.9	477	240
0852	Phaeophytin	mg/m3	0.91	0.98	0.005	8.5	556	519
0890	Phaeophytin	ug/L	0.43	0.52	0.15	3.7	65	30
0890	Phaeophytin	mg/m3	0.86	0.89	0.005	5.2	61	57
4903	Phaeophytin	ug/L	0.47	0.44	0.15	3.1	67	40
4903	Phaeophytin	mg/m3	0.97	0.87	0.005	4.4	54	53
0560	Phenanthrene	ug/L	0.29	-	0.29	0.29	1	0
0804	Phenanthrene	ug/L	0.285	-	0.285	0.285	1	0
0807	Phenanthrene	ug/L	0.024	0.078	0.0024	0.305	15	0
0814	Phenanthrene	ug/L	0.3	-	0.3	0.3	1	0
0817	Phenanthrene	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	Phenanthrene	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	Phenanthrene	ug/L	0.3	-	0.3	0.3	1	0
0831	Phenanthrene	ug/L	0.020	0.068	0.0024	0.285	17	0
0832	Phenanthrene	ug/L	0.3	-	0.3	0.3	1	0
0834	Phenanthrene	ug/L	0.021	0.073	0.0024	0.305	17	0
0840	Phenanthrene	ug/L	0.022	0.072	0.0024	0.29	16	0
0852	Phenanthrene	ug/L	0.024	0.072	0.0024	0.285	15	2
0890	Phenanthrene	ug/L	0.022	0.074	0.0024	0.3	16	0
4903	Phenanthrene	ug/L	0.15	0.20	0.0024	0.29	2	0
0560	Phenol	ug/L	1.95	-	1.95	1.95	1	0
0804	Phenol	ug/L	1.9	-	1.9	1.9	1	0
0807	Phenol	ug/L	0.16	0.50	0.02	2.05	16	1
0814	Phenol	ug/L	2	-	2	2	1	0
0817	Phenol	ug/L	0.16	0.48	0.02	1.9	15	1
0826	Phenol	ug/L	0.15	0.48	0.02	1.95	16	0
0829	Phenol	ug/L	2	-	2	2	1	0
0831	Phenol	ug/L	0.16	0.48	0.02	1.9	15	0
0832	Phenol	ug/L	2	-	2	2	1	0
0834	Phenol	ug/L	0.21	0.53	0.02	2.05	17	1
0840	Phenol	ug/L	0.27	0.61	0.02	1.95	15	2

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0852	Phenol	ug/L	0.18	0.52	0.02	1.9	13	1
0890	Phenol	ug/L	0.16	0.49	0.02	2	16	0
4903	Phenol	ug/L	0.67	1.1	0.02	1.95	3	0
0807	Phorate	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0817	Phorate	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0826	Phorate	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0831	Phorate	ug/L	0.015	4.5E-10	0.015	0.015	16	0
0834	Phorate	ug/L	0.015	4.5E-10	0.015	0.015	16	0
0840	Phorate	ug/L	0.015	4.5E-10	0.015	0.015	15	0
0852	Phorate	ug/L	0.015	4.4E-10	0.015	0.015	14	0
0890	Phorate	ug/L	0.015	4.5E-10	0.015	0.015	15	0
4903	Phorate	ug/L	0.015	0	0.015	0.015	2	0
0560	Pyrene	ug/L	0.29	-	0.29	0.29	1	0
0804	Pyrene	ug/L	0.285	-	0.285	0.285	1	0
0807	Pyrene	ug/L	0.022	0.075	0.0024	0.305	16	0
0814	Pyrene	ug/L	0.3	-	0.3	0.3	1	0
0817	Pyrene	ug/L	0.021	0.070	0.0024	0.285	16	0
0826	Pyrene	ug/L	0.022	0.072	0.0024	0.29	16	0
0829	Pyrene	ug/L	0.3	-	0.3	0.3	1	0
0831	Pyrene	ug/L	0.020	0.068	0.0024	0.285	17	0
0832	Pyrene	ug/L	0.3	-	0.3	0.3	1	0
0834	Pyrene	ug/L	0.021	0.073	0.0024	0.305	17	0
0840	Pyrene	ug/L	0.022	0.072	0.0024	0.29	16	0
0852	Pyrene	ug/L	0.025	0.072	0.0024	0.285	15	2
0890	Pyrene	ug/L	0.022	0.074	0.0024	0.3	16	0
4903	Pyrene	ug/L	0.098	0.17	0.0024	0.29	3	0
0804	Selenium, Dissolved	mg/L	0.00025	8.2E-12	0.0003	0.00025	18	0
0807	Selenium, Dissolved	mg/L	0.00025	8.4E-12	0.0003	0.00025	16	0
0814	Selenium, Dissolved	mg/L	0.00025	8.6E-12	0.0003	0.00025	17	0
0817	Selenium, Dissolved	mg/L	0.00025	8.2E-12	0.0003	0.00025	18	0
0826	Selenium, Dissolved	mg/L	0.00051	0.00025	0.0003	0.00075	38	0
0829	Selenium, Dissolved	mg/L	0.00025	8.2E-12	0.0003	0.00025	18	0
0831	Selenium, Dissolved	mg/L	0.00053	0.00025	0.0003	0.00075	36	0
0832	Selenium, Dissolved	mg/L	0.00025	0	0.0003	0.00025	8	0
0834	Selenium, Dissolved	mg/L	0.00027	0.000062	0.0003	0.0005	16	0
0840	Selenium, Dissolved	mg/L	0.00025	8.6E-12	0.0003	0.00025	17	0
0852	Selenium, Dissolved	mg/L	0.00051	0.00025	0.0003	0.00075	39	0
0890	Selenium, Dissolved	mg/L	0.00051	0.00025	0.0003	0.00075	38	0
4903	Selenium, Dissolved	mg/L	0.00025	0	0.0003	0.00025	8	0
0560	Selenium, Total	mg/L	0.0005	-	0.0005	0.0005	1	0
0804	Selenium, Total	mg/L	0.00026	0.000057	0.0003	0.0005	19	0
0807	Selenium, Total	mg/L	0.00026	0.000061	0.0003	0.0005	17	0
0814	Selenium, Total	mg/L	0.00026	0.000059	0.0003	0.0005	18	0
0817	Selenium, Total	mg/L	0.00026	0.000057	0.0003	0.0005	19	0
0826	Selenium, Total	mg/L	0.00052	0.00025	0.0003	0.00075	40	0
0829	Selenium, Total	mg/L	0.00026	0.000057	0.0003	0.0005	19	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0831	Selenium, Total	mg/L	0.00053	0.00025	0.0003	0.00075	38	0
0832	Selenium, Total	mg/L	0.00028	0.000083	0.0003	0.0005	9	0
0834	Selenium, Total	mg/L	0.00026	0.000061	0.0003	0.0005	17	0
0840	Selenium, Total	mg/L	0.00026	0.000059	0.0003	0.0005	18	0
0852	Selenium, Total	mg/L	0.00051	0.00025	0.0003	0.00075	41	0
0890	Selenium, Total	mg/L	0.0011	0.0038	0.0003	0.025	41	0
4903	Selenium, Total	mg/L	0.00028	0.000083	0.0003	0.0005	9	0
0804	Silver, Dissolved	mg/L	0.0000125	3.3E-13	1E-05	1.3E-05	18	0
0807	Silver, Dissolved	mg/L	0.0000125	3.3E-13	1E-05	1.3E-05	16	0
0814	Silver, Dissolved	mg/L	0.0000125	3.5E-13	1E-05	1.3E-05	17	0
0817	Silver, Dissolved	mg/L	0.0000125	3.3E-13	1E-05	1.3E-05	18	0
0826	Silver, Dissolved	mg/L	0.000059	0.000044	1E-05	0.0001	38	0
0829	Silver, Dissolved	mg/L	0.0000125	3.3E-13	1E-05	1.3E-05	18	0
0831	Silver, Dissolved	mg/L	0.000061	0.000044	1E-05	0.0001	36	0
0832	Silver, Dissolved	mg/L	0.0000125	2.4E-13	1E-05	1.3E-05	8	0
0834	Silver, Dissolved	mg/L	0.000013	0.0000031	1E-05	2.5E-05	16	0
0840	Silver, Dissolved	mg/L	0.0000125	3.5E-13	1E-05	1.3E-05	17	0
0852	Silver, Dissolved	mg/L	0.000057	0.000044	1E-05	0.0001	39	0
0890	Silver, Dissolved	mg/L	0.000059	0.000044	1E-05	0.0001	38	0
4903	Silver, Dissolved	mg/L	0.0000125	2.4E-13	1E-05	1.3E-05	8	0
0560	Silver, Total	mg/L	0.00015	-	0.0002	0.00015	1	0
0804	Silver, Total	mg/L	0.000020	0.000032	1E-05	0.00015	19	0
0807	Silver, Total	mg/L	0.000021	0.000033	1E-05	0.00015	17	0
0814	Silver, Total	mg/L	0.000020	0.000032	1E-05	0.00015	18	0
0817	Silver, Total	mg/L	0.000020	0.000032	1E-05	0.00015	19	0
0826	Silver, Total	mg/L	0.000062	0.000046	1E-05	0.00015	40	0
0829	Silver, Total	mg/L	0.000020	0.000032	1E-05	0.00015	19	0
0831	Silver, Total	mg/L	0.000064	0.000046	1E-05	0.00015	38	0
0832	Silver, Total	mg/L	0.000028	0.000046	1E-05	0.00015	9	0
0834	Silver, Total	mg/L	0.000021	0.000033	1E-05	0.00015	17	1
0840	Silver, Total	mg/L	0.000020	0.000032	1E-05	0.00015	18	0
0852	Silver, Total	mg/L	0.000061	0.000046	1E-05	0.00015	41	0
0890	Silver, Total	mg/L	0.00011	0.00031	1E-05	0.002	41	0
4903	Silver, Total	mg/L	0.000032	0.000046	1E-05	0.00015	9	1
0560	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0804	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0807	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0814	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0817	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0826	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0829	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0831	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0832	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0834	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0840	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0852	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0890	Styrene	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
4903	Styrene	ug/L	0.5	-	0.5	0.5	1	0
0560	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0804	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0807	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0814	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0817	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0826	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0829	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0831	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0832	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0834	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0840	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0852	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0890	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
4903	Tetrachloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0804	Thallium, Dissolved	mg/L	0.000005	7.4E-14	5E-06	5E-06	18	0
0807	Thallium, Dissolved	mg/L	0.000005	5.9E-14	5E-06	5E-06	16	0
0814	Thallium, Dissolved	mg/L	0.000005	7.8E-14	5E-06	5E-06	17	0
0817	Thallium, Dissolved	mg/L	0.000005	7.4E-14	5E-06	5E-06	18	0
0826	Thallium, Dissolved	mg/L	0.000055	0.000048	5E-06	0.0001	38	0
0829	Thallium, Dissolved	mg/L	0.0000062	0.0000034	5E-06	1.6E-05	18	2
0831	Thallium, Dissolved	mg/L	0.000058	0.000047	5E-06	0.0001	36	2
0832	Thallium, Dissolved	mg/L	0.0000064	0.0000039	5E-06	1.6E-05	8	1
0834	Thallium, Dissolved	mg/L	0.0000067	0.0000039	5E-06	1.7E-05	16	2
0840	Thallium, Dissolved	mg/L	0.0000062	0.0000033	5E-06	1.6E-05	17	2
0852	Thallium, Dissolved	mg/L	0.000055	0.000047	5E-06	0.0001	39	3
0890	Thallium, Dissolved	mg/L	0.000056	0.000047	5E-06	0.0001	38	3
4903	Thallium, Dissolved	mg/L	0.0000065	0.0000042	5E-06	1.7E-05	8	1
0560	Thallium, Total	mg/L	0.00025	-	0.0003	0.00025	1	0
0804	Thallium, Total	mg/L	0.000021	0.000056	5E-06	0.00025	19	4
0807	Thallium, Total	mg/L	0.000022	0.000059	5E-06	0.00025	17	4
0814	Thallium, Total	mg/L	0.000021	0.000057	5E-06	0.00025	18	4
0817	Thallium, Total	mg/L	0.00002	0.000056	5E-06	0.00025	19	4
0826	Thallium, Total	mg/L	0.000062	0.000055	5E-06	0.00025	40	4
0829	Thallium, Total	mg/L	0.000019	0.000056	5E-06	0.00025	19	3
0831	Thallium, Total	mg/L	0.000064	0.000056	5E-06	0.00025	38	2
0832	Thallium, Total	mg/L	0.000033	0.000081	5E-06	0.00025	9	1
0834	Thallium, Total	mg/L	0.000020	0.000059	5E-06	0.00025	17	2
0840	Thallium, Total	mg/L	0.000019	0.000058	5E-06	0.00025	18	2
0852	Thallium, Total	mg/L	0.000060	0.000056	5E-06	0.00025	41	2
0890	Thallium, Total	mg/L	0.0025	0.016	5E-06	0.1	41	2
4903	Thallium, Total	mg/L	0.000033	0.000081	5E-06	0.00025	9	1
0560	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0804	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0807	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0814	Toluene	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0817	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0826	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0829	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0831	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0832	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0834	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0840	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0852	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0890	Toluene	ug/L	0.5	-	0.5	0.5	1	0
4903	Toluene	ug/L	0.5	-	0.5	0.5	1	0
0560	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0804	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0807	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0814	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0817	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0826	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0829	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0831	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0832	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0834	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0840	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0852	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0890	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
4903	Total Xylenes	ug/L	0.5	-	0.5	0.5	1	0
0560	Toxaphene	ug/L	0.245	-	0.245	0.245	1	0
0804	Toxaphene	ug/L	0.24	-	0.24	0.24	1	0
0807	Toxaphene	ug/L	0.036	0.058	0.02	0.255	16	0
0814	Toxaphene	ug/L	0.25	-	0.25	0.25	1	0
0817	Toxaphene	ug/L	0.034	0.055	0.02	0.24	16	0
0826	Toxaphene	ug/L	0.035	0.056	0.02	0.245	16	0
0829	Toxaphene	ug/L	0.25	-	0.25	0.25	1	0
0831	Toxaphene	ug/L	0.034	0.053	0.02	0.24	17	0
0832	Toxaphene	ug/L	0.25	-	0.25	0.25	1	0
0834	Toxaphene	ug/L	0.035	0.057	0.02	0.255	17	0
0840	Toxaphene	ug/L	0.035	0.056	0.02	0.245	16	0
0852	Toxaphene	ug/L	0.035	0.057	0.02	0.24	15	0
0890	Toxaphene	ug/L	0.035	0.057	0.02	0.25	16	0
4903	Toxaphene	ug/L	0.097	0.13	0.02	0.245	3	0
0560	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0804	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0807	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0814	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0817	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0826	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0829	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0831	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0832	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0834	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0840	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0852	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0890	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
4903	Trans-1,2-Dichloroethylene	ug/L	0.5	-	0.5	0.5	1	0
0560	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0804	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0807	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0814	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0817	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0826	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0829	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0831	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0832	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0834	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0840	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0852	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0890	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
4903	Trans-1,3-Dichloropropene	ug/L	0.5	-	0.5	0.5	1	0
0560	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0804	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0807	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0814	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0817	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0826	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0829	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0831	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0832	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0834	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0840	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0852	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0890	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
4903	Trichlorofluoromethane	ug/L	0.5	-	0.5	0.5	1	0
0804	Vanadium, Dissolved	mg/L	0.00035	0.000057	0.0003	0.00049	18	18
0807	Vanadium, Dissolved	mg/L	0.00031	0.000038	0.0003	0.00038	16	16
0814	Vanadium, Dissolved	mg/L	0.00030	0.000036	0.0003	0.00036	17	17
0817	Vanadium, Dissolved	mg/L	0.00031	0.000037	0.0002	0.00037	18	18
0826	Vanadium, Dissolved	mg/L	0.00028	0.000077	0.0002	0.00044	37	30
0829	Vanadium, Dissolved	mg/L	0.00030	0.000037	0.0003	0.00037	18	18
0831	Vanadium, Dissolved	mg/L	0.00027	0.000084	0.0002	0.00044	35	27
0832	Vanadium, Dissolved	mg/L	0.00030	0.000037	0.0003	0.00036	8	8
0834	Vanadium, Dissolved	mg/L	0.00032	0.000083	0.0003	0.00058	16	16
0840	Vanadium, Dissolved	mg/L	0.00029	0.000055	0.0001	0.00036	17	17
0852	Vanadium, Dissolved	mg/L	0.00027	0.000084	0.0002	0.00045	38	29
0890	Vanadium, Dissolved	mg/L	0.00027	0.000072	0.0002	0.0004	37	30
4903	Vanadium, Dissolved	mg/L	0.00034	0.000077	0.0003	0.00052	8	8

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0804	Vanadium, Total	mg/L	0.00048	0.00017	0.0003	0.00105	19	19
0807	Vanadium, Total	mg/L	0.00037	0.000069	0.0003	0.00052	16	16
0814	Vanadium, Total	mg/L	0.00036	0.000095	0.0003	0.00071	18	18
0817	Vanadium, Total	mg/L	0.00042	0.00017	0.0003	0.0011	19	19
0826	Vanadium, Total	mg/L	0.00039	0.000095	0.0003	0.0008	40	39
0829	Vanadium, Total	mg/L	0.00039	0.00018	0.0003	0.0011	19	19
0831	Vanadium, Total	mg/L	0.00039	0.00019	0.0002	0.0014	38	36
0832	Vanadium, Total	mg/L	0.00049	0.00038	0.0003	0.0015	9	9
0834	Vanadium, Total	mg/L	0.00039	0.00023	0.0003	0.00125	16	16
0840	Vanadium, Total	mg/L	0.00036	0.000086	0.0002	0.00064	18	18
0852	Vanadium, Total	mg/L	0.00038	0.000093	0.0003	0.00076	41	40
0890	Vanadium, Total	mg/L	0.00037	0.000084	0.0002	0.00058	40	38
4903	Vanadium, Total	mg/L	0.00077	0.00095	0.0003	0.00326	9	9
0560	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0804	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0807	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0814	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0817	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0826	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0829	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0831	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0832	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0834	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0840	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0852	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0890	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
4903	Vinyl Acetate	ug/L	2.5	-	2.5	2.5	1	0
0560	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0804	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0807	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0814	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0817	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0826	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0829	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0831	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0832	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0834	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0840	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0852	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0890	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
4903	Vinyl Chloride	ug/L	0.5	-	0.5	0.5	1	0
0804	Zinc, Dissolved	mg/L	0.00056	0.00012	0.0005	0.00071	4	4
0807	Zinc, Dissolved	mg/L	0.00052	0.00011	0.0004	0.00064	4	4
0814	Zinc, Dissolved	mg/L	0.00063	0.00034	0.0004	0.00113	4	4
0817	Zinc, Dissolved	mg/L	0.00058	0.00018	0.0004	0.00081	4	4
0826	Zinc, Dissolved	mg/L	0.0016	0.0023	0.0004	0.01	25	25
0829	Zinc, Dissolved	mg/L	0.00052	0.000021	0.0005	0.00053	2	2

Table A-25. Summary Statistics for Metals and Organic Compounds Analyzed in Lake Washington Surface Water (continued)

Station	Parameter	Units	Mean	Standard Deviation	Min	Max	# of Samples	# of Detects
0831	Zinc, Dissolved	mg/L	0.00084	0.00083	0.0003	0.0036	22	16
0832	Zinc, Dissolved	mg/L	0.00061	-	0.0006	0.00061	1	1
0834	Zinc, Dissolved	mg/L	0.00088	0.000012	0.00087	0.00089	2	2
0840	Zinc, Dissolved	mg/L	0.00050	0.00011	0.0004	0.00057	2	2
0852	Zinc, Dissolved	mg/L	0.0010	0.00093	0.0003	0.00384	22	20
0890	Zinc, Dissolved	mg/L	0.00086	0.00080	0.0003	0.00385	22	17
4903	Zinc, Dissolved	mg/L	0.00055	-	0.0006	0.00055	1	1
0560	Zinc, Total	mg/L	0.0017	-	0.0017	0.0017	1	1
0804	Zinc, Total	mg/L	0.0010	0.00058	0.0005	0.00276	19	19
0807	Zinc, Total	mg/L	0.00090	0.00047	0.0004	0.00228	17	17
0814	Zinc, Total	mg/L	0.00078	0.00029	0.0005	0.0016	17	17
0817	Zinc, Total	mg/L	0.0013	0.0013	0.0005	0.00592	19	19
0826	Zinc, Total	mg/L	0.0015	0.0019	0.0004	0.0099	40	40
0829	Zinc, Total	mg/L	0.00076	0.00052	0.0004	0.00279	19	19
0831	Zinc, Total	mg/L	0.00093	0.00058	0.0003	0.0027	38	37
0832	Zinc, Total	mg/L	0.0013	0.0015	0.0005	0.00532	9	9
0834	Zinc, Total	mg/L	0.0016	0.0024	0.0006	0.01	16	16
0840	Zinc, Total	mg/L	0.00082	0.00038	0.0005	0.00217	18	18
0852	Zinc, Total	mg/L	0.0012	0.0014	0.0004	0.0087	41	41
0890	Zinc, Total	mg/L	0.0011	0.00077	0.0004	0.00397	41	40
4903	Zinc, Total	mg/L	0.0038	0.0063	0.0006	0.02	9	9

Table A-26. Complete Data for TSI-TP, TSI-secchi, and TSI-chia Indices Calculated for Nearshore and Pelagic Areas of Lake Washington

Nearshore vs. Pelagic

YEAR	Nearshore TSI-TP (1 m)	st.d.	n	Pelagic TSI TP (1 m)	st.d.	n	0852 TSI-TP (0 - 10 m)	st.d.	n
1990	42	9	30						
1991	46	4	30						
1992	42	6	36	38	7	12			
1993	49	12	36	47	12	14	46	13	16
1994	45	4	42	44	5	18	43	3	17
1995	42	7	35	39	7	26	38	8	18
1996	44	8	65	43	6	47	41	6	30
1997	47	7	35	43	9	28	41	9	17
1998	38	5	36	34	6	28	32	6	16
1999	40	4	35	40	6	40	38	5	20
2000	37	5	70	35	5	64	34	5	24
2001	41	7	70	38	6	65	35	5	25

YEAR	Nearshore TSI-secchi	st.d.	n	Pelagic TSI-secchi	st.d.	n	0852 TSI -secchi	st.d.	n
1990	43	6	30						
1991	43	5	30						
1992	40	3	35	37	3	14			
1993	43	5	36	40	5	10	40	6	5
1994	41	3	42	40	6	17	43	8	6
1995	42	4	40	41	4	30	40	4	6
1996	42	4	65	41	4	47	39	4	10
1997	43	4	69	40	3	48	40	3	11
1998	38	2	69	36	2	47	36	2	10
1999	44	3	69	42	3	50	42	3	10
2000	40	5	66	39	5	49	39	4	10
2001	40	6	70	38	6	49	38	7	10

YEAR	Nearshore TSI-chla	st.d.	n	Pelagic TSI-chla (1 m)	st.d.	n	0852 TSI-chla (0-10m)	st.d.	n
1990	39	9	28						
1991	43	7	29						
1992	39	6	27	39	6	5			
1993	36	10	31	37	9	11	36	9	10
1994	43	7	84	42	8	35	42	9	20
1995	44	9	56	42	10	41	40	14	17
1996	43	4	51	41	5	41	39	4	20
1997	45	6	70	44	6	55	45	7	27
1998	42	4	69	40	4	56	38	5	26
1999	45	4	70	44	6	60	42	10	27
2000	44	7	70	44	8	59	45	8	29
2001	45	7	70	43	8	60	43	8	30

North vs. South

YEAR	Nearshore North TSI TP (1m)	st. d.	n.	Nearshore South TSI TP (1m)	st. d.	n.
1990	41	9	24	46	7	6
1991	46	4	24	46	3	6
1992	42	6	22	43	5	14
1993	48	12	24	51	11	12
1994	45	5	30	45	2	12
1995	42	7	25	41	6	10
1996	44	8	47	44	8	18
1997	47	8	25	45	7	10
1998	38	5	26	37	7	10
1999	41	5	25	38	3	10
2000	38	5	50	36	4	20
2001	41	7	50	40	7	20

YEAR	Pelagic North TSI TP (1m)	st. d.	n.	Pelagic South TSI TP (1m)	st. d.	n.
1990						
1991						
1992				38	7	12
1993	46	15	6	47	10	8
1994	44	5	12	45	5	6
1995	38	8	11	39	7	15
1996	41	4	20	44	8	27
1997	43	12	12	43	6	16
1998	32	4	12	35	8	16
1999	40	5	20	40	6	20
2000	35	7	29	35	4	35
2001	38	6	30	38	7	35

YEAR	Nearshore North TSI-secchi	st. d.	n.	Nearshore South TSI-secchi	st. d.	n
1990	43	5	24	46	9	6
1991	42	5	24	44	5	6
1992	41	4	20	40	2	15
1993	42	5	24	43	5	12
1994	41	3	30	41	3	12
1995	42	4	29	42	4	11
1996	42	4	47	43	5	18
1997	43	4	49	42	4	20
1998	38	2	50	37	2	19
1999	44	3	49	43	3	20
2000	40	5	46	39	4	20
2001	40	6	50	39	5	20

YEAR	Pelagic North TSI-secchi		st. d.	Pelagic South TSI-secchi	st.	n.
1990						
1991						
1992				37	3	14
1993	40	6	5	39	4	5
1994	40	7	12	40	3	5
1995	41	4	12	41	4	18
1996	39	4	20	41	4	27
1997	41	3	20	40	3	28
1998	35	2	20	36	2	27
1999	42	3	20	43	3	30
2000	39	5	20	38	5	29
2001	39	6	20	38	5	29

YEAR	Nearshore North TSI-chla	st. d.	n.	Nearshore South TSI-chla	st. d.	n.
1990	40	10	23	37	8	5
1991	44	7	23	43	10	6
1992	39	7	20	39	5	7
1993	37	7	20	33	15	11
1994	43	7	60	43	7	24
1995	45	9	40	42	9	16
1996	43	4	37	43	5	14
1997	46	7	50	44	5	20
1998	42	4	49	41	4	20
1999	46	3	50	44	4	20
2000	44	7	50	44	6	20
2001	45	8	50	44	5	20

YEAR	Pelagic North TSI-chla (1 m)	st. d.	n.	Pelagic South TSI-chla (1 m)	st. d.	n.
1990						
1991						
1992						
1993	40	5	3	39	6	5
1994	42	9	23	36	10	8
1995	42	11	17	43	7	12
1996	40	4	20	42	9	24
1997	44	6	26	43	5	21
1998	39	3	26	44	6	29
1999	44	8	29	40	4	30
2000	44	8	29	44	3	30
2001	44	9	30	43	7	30

Appendix B
Metals and Organic Compounds Analyzed in Lake Washington

Table B-1.
Metals Analyzed in Lake Washington

Metals Analyzed	Metals Analyzed
Aluminum	**Lead**
Aluminum, Dissolved[a], ICP[b]	Lead, Dissolved, ICP-MS
Aluminum, Dissolved, ICP-MS[c]	Lead, Total, ICP
Aluminum, Total[d], ICP	Lead, Total, ICP-MS
Aluminum, Total, ICP-MS	**Magnesium**
Antimony	Magnesium, Dissolved, ICP
Antimony, Dissolved, ICP-MS	**Manganese**
Antimony, Total, ICP	Manganese, Dissolved, ICP
Antimony, Total, ICP-MS	Manganese, Total, ICP
Arsenic	**Mercury**
Arsenic, Dissolved, ICP-MS	Mercury, Dissolved, CVAA
Arsenic, Total, ICP	Mercury, Dissolved, CVAF
Arsenic, Total, ICP-MS	Mercury, Total, CVAA
Barium	Mercury, Total, CVAF
Barium, Dissolved, ICP-MS	**Molybdenum**
Barium, Total, ICP-MS	Molybdenum, Dissolved, ICP-MS
Beryllium	Molybdenum, Total, ICP
Beryllium, Dissolved, ICP-MS	Molybdenum, Total, ICP-MS
Beryllium, Total, ICP	**Nickel**
Beryllium, Total, ICP-MS	Nickel, Dissolved, ICP-MS
Cadmium	Nickel, Total, ICP-MS
Cadmium, Dissolved, ICP-MS	**Selenium**
Cadmium, Total, ICP	Selenium, Dissolved, ICP-MS
Cadmium, Total, ICP-MS	Selenium, Total, ICP
Calcium	Selenium, Total, ICP-MS
Calcium, Dissolved, ICP	**Silver**
Calcium, Total, ICP	Silver, Dissolved, ICP-MS
Chromium	Silver, Total, ICP
Chromium, Dissolved, ICP-MS	Silver, Total, ICP-MS
Chromium, Total, ICP	**Thallium**
Chromium, Total, ICP-MS	Thallium, Dissolved, ICP-MS
Cobalt	Thallium, Total, ICP
Cobalt, Dissolved, ICP-MS	Thallium, Total, ICP-MS
Cobalt, Total, ICP-MS	**Vanadium**
Copper	Vanadium, Dissolved, ICP-MS
Copper, Dissolved, ICP-MS	Vanadium, Total, ICP-MS
Copper, Total, ICP	**Zinc**
Copper, Total, ICP-MS	Zinc, Dissolved, ICP-MS
Iron	Zinc, Total, ICP
Iron, Dissolved, ICP	Zinc, Total, ICP-MS
Iron, Total, ICP	

[a] The concentration of metal dissolved in the water.
[b] Inductively coupled plasma-optical emission spectrometry.
[c] Inductively coupled plasma-mass spectrometry.
[d] The concentration of metal dissolved and undissolved in the water.

Table B-2.
Organic Compounds Analyzed in Lake Washington

Organic Compounds Analyzed	Organic Compounds Analyzed
1,1,1-Trichloroethane	Bromomethane
1,1,2,2-Tetrachloroethane	Caffeine
1,1,2-Trichloroethane	Carbazole
1,1,2-Trichloroethylene	Carbon Disulfide
1,1-Dichloroethane	Carbon Tetrachloride
1,1-Dichloroethylene	Chlordane
1,2,4-Trichlorobenzene	Chlorobenzene
1,2-Dichlorobenzene	Chlorodibromomethane
1,2-Dichloroethane	Chloroethane
1,2-Dichloropropane	Chloroform
1,2-Diphenylhydrazine	Chloromethane
1,3-Dichlorobenzene	Chlorpyrifos
1,4-Dichlorobenzene	Chlorpyrifos-D10
2,4,5,6-Tetrachloro-m-xylene	Chrysene
2,4,5-T	Cis-1,3-Dichloropropene
2,4,5-TP (Silvex)	Coprostanol
2,4,5-Trichlorophenol	d14-Terphenyl
2,4,6-Tribromophenol	d4-1,2-Dichlorobenzene
2,4,6-Trichlorophenol	d4-1,2-Dichloroethane
2,4-D	d4-2-Chlorophenol
2,4-DB	d5-Nitrobenzene
2,4-Dichlorophenol	d5-Phenol
2,4-Dimethylphenol	d8-Toluene
2,4-Dinitrophenol	Dalapon
2,4-Dinitrotoluene	Decachlorobiphenyl
2,6-Dinitrotoluene	Delta-BHC
2-Butanone (MEK)	Diazinon
2-Chloroethylvinyl ether	Dibenzo(a,h)anthracene
2-Chloronaphthalene	Dibenzofuran
2-Chlorophenol	Dicamba
2-Fluorobiphenyl	Dichloroprop
2-Fluorophenol	Dieldrin
2-Methylnaphthalene	Diethyl Phthalate
2-Methylphenol	Dimethyl Phthalate
2-Nitroaniline	Di-N-Butyl Phthalate
2-Nitrophenol	Di-N-Octyl Phthalate
3,3'-Dichlorobenzidine	Dinoseb
3-Nitroaniline	Disulfoton
4,4'-DDD	Endosulfan I
4,4'-DDE	Endosulfan II
4,4'-DDT	Endosulfan Sulfate
4,6-Dinitro-O-Cresol	Endrin
4-Bromophenyl Phenyl Ether	Endrin Aldehyde
4-Chloro-3-Methylphenol	Ethylbenzene
4-Chloroaniline	Fluoranthene
4-Chlorophenyl Phenyl Ether	Gamma-BHC (Lindane)
4-Methyl-2-Pentanone (MIBK)	Heptachlor
4-Methylphenol	Heptachlor Epoxide

Organic Compounds Analyzed	Organic Compounds Analyzed
4-Nitroaniline	Hexachlorobenzene
4-Nitrophenol	Hexachlorobutadiene
Acenaphthene	Hexachlorocyclopentadiene
Acenaphthylene	Hexachloroethane
Acetone	Indeno(1,2,3-Cd)Pyrene
Acrolein	Isophorone
Acrylonitrile	Malathion
Aldrin	MCPA
Alpha-BHC	MCPP
Aniline	Methoxychlor
Anthracene	Methylene Chloride
Aroclor 1016	Naphthalene
Aroclor 1221	Nitrobenzene
Aroclor 1232	N-Nitrosodimethylamine
Aroclor 1242	N-Nitrosodi-N-Propylamine
Aroclor 1248	N-Nitrosodiphenylamine
Aroclor 1254	Parathion-Ethyl
Aroclor 1260	Parathion-Methyl
Benzene	Pentachlorophenol
Benzidine	Phaeophytin
Benzo(a)anthracene	Phenanthrene
Benzo(a)pyrene	Phenol
Benzo(b)fluoranthene	Phorate
Benzo(g,h,i)perylene	Pyrene
Benzo(k)fluoranthene	Styrene
Benzoic Acid	Tetrachloroethylene
Benzyl Alcohol	Toluene
Benzyl Butyl Phthalate	Total Xylenes
Beta-BHC	Toxaphene
Bis(2-Chloroethoxy)Methane	Trans-1,2-Dichloroethylene
Bis(2-Chloroethyl)Ether	Trans-1,3-Dichloropropene
Bis(2-Chloroisopropyl)Ether	Trichlorofluoromethane
Bis(2-Ethylhexyl)Phthalate	Triphenyl Phosphate
Bromodichloromethane	Vinyl Acetate
Bromoform	Total Xylenes
Beta-BHC	Toxaphene
Bis(2-Chloroethoxy)Methane	Trans-1,2-Dichloroethylene
Bis(2-Chloroethyl)Ether	Trans-1,3-Dichloropropene
Bis(2-Chloroisopropyl)Ether	Trichlorofluoromethane
Bis(2-Ethylhexyl)Phthalate	Triphenyl Phosphate
Bromodichloromethane	Vinyl Acetate
Bromoform	

Appendix C
Calculations for Determining Metal Concentrations Based on Hardness

Table C-1.
Calculations for Determining Metal Concentrations Based on Hardness

Metal	Acute	Chronic
Cadmium	Hardness-Adjusted Concentration = (CF)($e^{(1.128[\ln(\text{hardness})]-3.828)}$) where CF=1.136672-[(ln hardness)(0.041838)]	Hardness-Adjusted Concentration = (CF)($e^{(0.7852[\ln(\text{hardness})]-3.490)}$) where CF=1.101672-[(ln hardness) (0.041838)]
Chromium III	Hardness-Adjusted Concentration = (CF)($e^{(0.8190[\ln(\text{hardness})]+3.688)}$) where CF=0.316	Hardness-Adjusted Concentration = (CF)($e^{(0.8190[\ln(\text{hardness})]+1.561)}$) where CF=0.860
Copper	Hardness-Adjusted Concentration = (CF)($e^{(0.9422[\ln(\text{hardness})]-1.464)}$) where CF=0.860	Hardness-Adjusted Concentration = (CF)($e^{(0.8545[\ln(\text{hardness})]-1.465)}$) where CF=0.960
Lead	Hardness-Adjusted Concentration = (CF)($e^{(1.273[\ln(\text{hardness})]-1.460)}$) where CF=1.46203-[(ln hardness)(0.145712)]	Hardness-Adjusted Concentration = (CF)($e^{(1.273[\ln(\text{hardness})]-4.705)}$) where CF=1.46203-[(ln hardness)(0.145712)]
Nickel	Hardness-Adjusted Concentration = (CF)($e^{(0.8460[\ln(\text{hardness})]+3.612)}$) where CF=0.998	Hardness-Adjusted Concentration = (CF)($e^{(0.8460[\ln(\text{hardness})]+1.1645)}$) where CF=0.997
Silver	Hardness-Adjusted Concentration = (CF)($e^{(0.1.72[\ln(\text{hardness})]-6.52)}$) where CF=0.85	NA
Zinc	Hardness-Adjusted Concentration = (CF)($e^{(0.8473[\ln(\text{hardness})]+0.8604)}$) where CF=0.978	Hardness-Adjusted Concentration = (CF)($e^{(0.8473[\ln(\text{hardness})]+0.7614)}$) where CF=0.986

CF = Conversion factor, used to calculate dissolved metal concentrations.
NA = Not Applicable

Appendix D
Procedure for Treating Parameter Distributions for Means, Standard Deviations, and Statistical Tests

Table D-1. Procedure for Treating Parameter Distributions for Means, Standard Deviations, and Statistical Tests

Parameter	Location	Assumed Distribution	Kolmogorov Smirnov Test for Normality	Mean ≈ Median of Distribution
Total Phosphorus	Whole-lake	Log-Normal	Yes	Yes
	Nearshore	Log-Normal	Yes	Yes
	Pelagic	Log-Normal	Yes	Yes
	Epilimnion	Log-Normal	No	Yes
	Hypolimnion	Log-Normal	Yes	Yes
Souble Reactive Phosphorus	Whole-lake	Normal	Yes	Yes
	Neashore	Normal	No	Yes
	Pelagic	Normal	Yes	Yes
Total Nitrogen	Whole-lake	Normal	Yes	Yes
	Nearshore	Normal	Yes	Yes
	Pelagic	Normal	No	Yes
	Epilimnion	Normal	No	Yes
	Hypolimnion	Normal	Yes	Yes
Nitrate-Nitrogen*	Whole-lake	Normal	No	No
	Nearshore	Normal	No	No
	Pelagic	Normal	Yes	Yes
Ammonium-Nitrogen	Whole-lake	Normal	No	Yes
	Nearshore	Normal	No	Yes
Dissolved Oxygen	Hypolimnion	Normal	Yes	Yes
Transparency	Whole-lake	Normal	No	Yes
	Nearshore	Normal	No	Yes
	Pelagic	Normal	No	Yes
Chlorophyll *a*	Whole-Lake	Log-Normal	No	Yes
	Nearshore	Log-Normal	No	Yes
	Pelagic	Log-Normal	No	Yes
Temperature	Whole-Lake	Normal	No	Yes
Alkalinity	Station 0852	Normal	No	Yes
pH	Station 0852	Normal	No	Yes
Conductivity	No test for normality done.			

*Nitrate-Nitrogen data was treated as normally distributed and arithmetic means were presented because it was unclear by using the Kolmogorov-Smirnov test and by looking at the means and medians as to the actual distribution of the data.